District of Columbia
DEPARTMENT OF CONSUMER AND REGULATORY AFFAIRS

SPECIAL INSPECTION PROGRAM
PROCEDURE MANUAL
2012

DEPARTMENT OF CONSUMER & REGULATORY AFFAIRS

Contents

CHAPTER 1
DEFINITIONS/TERMS

Architect of record (AR): The registered design professional (RDP) retained by the Owner to design or specify architectural construction in accordance with the District of Columbia Construction Code and whose signature and seal appear on the DCRA-approved architectural construction documents.

Building Code: The current International Building Code (IBC) as amended by the current 12A DCMR (the "Construction Code Supplement").

Certificate of Occupancy: Document issued by DCRA after completion of construction and prior to occupancy stating that the use complies with the applicable Zoning Regulations and the Construction Codes, including related building, electrical, plumbing, mechanical and fire prevention requirements. Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of the applicable Construction Codes, Zoning Regulations or other laws or regulations of the District

Certification: A statement by the Registered Design Professional that indicates the item(s) under consideration, in the Registered Design Professional's opinion and to the best of the Registered Design Professional's knowledge, complies with DCRA-approved documents. A certification shall carry the original signature and seal of the Registered Design Professional making the statement.

Chief Building Official (CBO): The Chief Building Official is the individual that is hired or has been appointed to the DCHR job description of that title and has the designated authorities of the District of Columbia Code Official.

Code Official: The Code Official is the Director of the Department (12 DCMR §103.1) or his or her designee.

Construction Documents: Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit.

District of Columbia-Approved Documents:
1. Construction documents as approved by the District of Columbia including approved revisions;
2. Fabrication and erection documents as approved by the District of Columbia including approved revisions;
3. Soils-related documents as approved by the geotechnical engineer of record including approved revisions.

District of Columbia Construction Codes (DCCC) The D.C. Construction Codes, consist of the Building Code, Residential Code, Electrical Code, Fuel Gas Code, Mechanical Code, Plumbing Code, Property Maintenance Code, Fire Safety Code, Energy Conservation Code and

Existing Building Code, as defined in Sections 101.2 through 101.4.8 of 12A DCMR. which are adopted pursuant to the provisions of the Construction Codes Approval and Amendments Act of 1986, effective March 21, 1987 (D.C. Law 6-216; D.C. Official Code § 6-1401 et seq.).

Department or DCRA: The District of Columbia Department of Consumer and Regulatory Affairs.

District of Columbia Special Inspections Program (DCSIP) The inspection program for construction projects subject to special inspections during construction, in accordance with IBC Chapter 17 as amended by the current 12A DCMR (the "Construction Code Supplement"). The requirements of District of Columbia Special Inspections Program are contained in this document, Special Inspections Program, (DCSIP 2011).

EIFS: Exterior Insulation and Finish Systems

Fabricated item. Structural, load-bearing or lateral load-resisting assemblies consisting of materials assembled prior to installation in a building or structure or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standard specifications referenced by this code, such as rolled structural steel shapes, steel-reinforcing bars, masonry units and wood structural panels shall not be considered "fabricated items."

Fabrication and Erection Documents. Written, graphic and pictorial documents prepared or assembled after issuance of a building permit and in addition to the District-approved construction documents, describing the design, location and physical characteristics of the building components or materials necessary for fabrication, assembly or erection of the elements of the project.

Final report of special inspections. A certification by the special inspections engineer of record which shall indicate that all construction elements subject to special inspections for all materials or phases of construction have been inspected prior to concealment, the required special inspections are completed, and in the special inspections engineer of record's professional opinion and to the best of the special inspections engineer of record's knowledge, complies with District-approved documents and project specifications. The final report of special inspections shall carry the signature and seal of the special inspections engineer of record making the statement.

Geotechnical Engineer of Record (GER). The registered design professional retained by the Owner to design or specify earthwork and foundations in accordance with the District of Columbia's Construction Code and whose seal and signature appear on the District-approved geotechnical report.

General Contractor (GC): A person who contracts on predetermined terms to provide labor and materials and to be responsible for the performance of a construction job in accordance with District-approved plans and specifications and is responsible for jobsite safety. General

Contractors are required to be licensed with the Department of Consumer and Regulatory Affairs as a General Contractor (as of October 1, 2009).

Homestart Act: The Homestart Regulatory Improvement Amendment Act of 2002, codified as D.C. Official Code, 2001 Ed. §6-1405.04 (a).

Inspection: The continuous or periodic observation of work and the performance of tests for certain building or structure components to establish substantial conformance with the District-approved documents as required by the District of Columbia's Construction codes and this document

Inspection Report: A report prepared by the SEIR and submitted to the Code Official that indicates the status of construction elements observed subject to special inspections as identified in the District-approved Statement of Special Inspections.

Inspection and Testing Agency: An established and recognized agency or agencies, meeting the requirements of ASTM E 329 and accredited by a District-recognized accreditation body, retained by the Owner, independent of the contractors performing the work subject to special inspections, and approved by DCRA to perform special inspections and materials testing required by the District of Columbia's Construction Codes.

IBC: International Building Code.

Non-Structural Elements: Elements of a building that are not primary or secondary structural elements. Examples include exterior curtain walls and cladding, nonload-bearing partitions, stair railings, etc.

Owner: The word "owner" shall be construed as though followed by the words "or the owner's duly authorized representative."

Pre-Engineered Structural Elements. Structural elements specified by the structural engineer of record but which may be designed by a specialty registered design professional. Examples are items such as open web steel joists and joist girders; wood trusses; combination wood, metal and plywood joists; precast concrete elements, prefabricated wood or metal buildings; tilt-up concrete panel reinforcement and lifting hardware.

Primary Structural System. The combination of structural (load bearing) elements which serve to support the weight of the building's structural shell, the applicable live loads based upon use and occupancy, and wind, snow, thermal and seismic environmental loads.

Registered design professional (RDP). An architect or professional engineer licensed in the District of Columbia.

Registered Design Professional in Responsible Charge (RDPRC). The registered design professional, acting as the owner's agent, who prepares plans, specifications and the Statement of Special Inspections that comply with the codes necessary to obtain a building permit, including

approved revisions. The registered design professional in responsible charge shall review, seal and sign, and submit the Final Report of Special Inspections.

Special Inspections. The continuous or periodic observations of executed work and performance tests, and the conduction of materials tests, during construction of building components, elements and connections requiring special expertise to substantiate adequacy in compliance with Sections 106.3 and 109.3.9 of 12A DCMR, and Chapter 17 of the International Building Code requirements. Special inspections are conducted by the special inspections engineer of record, not the building official, and are in addition to other inspections required elsewhere by the building code

Special Inspections Section (SIS). The section within DCRA responsible for monitoring and enforcing the special inspections program.

Statement of Special Inspections (SSI). The statement of special inspections is a statement prepared by the owner and the appropriate registered design professionals (the architect of record, the geotechnical engineer of record, and the structural engineer of record) and submitted by the permit applicant as a condition for permit issuance in accordance with the District of Columbia's Construction Code. The statement of special inspections identifies the scope of the special inspections services applicable to a construction project, and the registered design professionals and the inspection and testing agency selected to provide those services.

Special Inspections Engineer of Record (SIER). The registered design professional, registered in the District of Columbia, who is directly responsible for special inspections, materials testing and related services as described in the District approved statement of special inspections and this document. The special inspections engineer of record shall be retained by the owner, independent of the contractors executing the work subject to special inspections.

Structural Engineer of Record (SER). The registered design professional registered in the District of Columbia, retained by the Owner to design or specify structural documents accordance with the District of Columbia's Construction Code and whose signature and seal appear on the District approved structural construction documents

CHAPTER 2
PURPOSES

This Manual identifies the responsibilities, outlines procedural requirements, emphasizes codes compliance and safety, address schedule(s), and other related activities associated with providing special inspection services, as required by Chapter 17 of the International Building Code in the District of Columbia. The District of Columbia Special Inspections Program is adjunct of the Third Party Inspections Program.

Under the International Building Code, Special Inspection is not a discretionary activity. The conditions under which special inspections must be utilized is clearly stated in IBC Section 1704, however, there are provisions for the Building official to waive special inspections for work of a minor nature.

Special Inspection is the monitoring of the materials and workmanship critical to the integrity of the building structure. It is a review of the work of the contractors and their employees to ensure that the approved plans and specifications are being followed and that the relevant codes and referenced standards are being observed. The Special Inspection process is in addition to the inspections conducted by the Building Official and Structural Observation by the Design Professional. Special inspections and tests are required to be performed by qualified, independent agents with special expertise as approved by the Building Official.

The owner shall be responsible for retaining the services of an independent Inspection Testing Agency, if such services are required by this manual. Under no circumstances shall these services be provided by an independent agency, retained or engaged by the general construction contractor or any of its subcontractors. The independent inspection and testing agency shall monitor the quality of construction and provide a communication link with DCRA.

As part of the general requirements Section 1704 of the Building Code, Special Inspections, a Statement of Special Inspections (which includes a Schedule of Special Inspection Services) prepared by the Registered Design Professional in Responsible Charge shall be submitted to the Building Official at time of permit application.

CHAPTER 3
SPECIAL INSPECTIONS REQUIRED

The Special Inspections Program requirements, outlined in this manual, shall apply to the following structures and/or structural elements, submitted in the Statement of the Special Inspection or, when so required by the Building Official (list is not all inclusive).

- All high-rise buildings, as defined by the most current adopted version of IBC as modified accordingly.
- Construction requiring installation of deep foundations (e.g. Pile and pier foundations).
- Fabrication of structural load-bearing members and assemblies performed on the premises of a fabricator's shop.
- All pre-stressed concrete elements of buildings and structures regardless of their size.
- All precast concrete structural members and tilt-up concrete panels.
- All structural steel framed buildings which include any of the following:
    - Field welded, bolted rigid or semi-rigid connections for the purpose of stability or resistance to lateral loads
    - Bolted or welded stability bracing
    - Bolted connections that require a minimum pretension to be achieved
    - High strength bolting in accordance to ASTM 390 & 425
    - Clear spans of over 50 feet
    - Structural steel trusses or joists other than those of SJI specification
    - Plate girders of any span
    - Space frames with clear spans of over 35 feet
    - Cable supported structures
    - Open-web steel-joists and joist-girders (including those manufactured to SJI specifications)
    - Steel floor and roof decks
    - Field-welded shear studs
    - Welding of structural steel
    - Welding of concrete reinforcement steel
- Cold formed light gage steel primary structural members, e.g. in roof trusses and walls.
- All masonry designed in accordance with ACI 530 /ASCE 5 and ACI 530.1 / ASCE 6 that is used as a structural member and fire rated assembly; (e.g. all load bearing masonry, non-load bearing vertical shaft enclosures, other non-load bearing grouted walls etc.).
- Tower Cranes and Manlifts.
- Soils: Existing conditions, verification of site preparation prior to placement of prepared fill, verification of fill material, maximum lift thickness and in place densities meet the requirements of the approved soils reports.

- Pile foundations: installation and testing of pile foundations and record installation load test and cutoff and tip elevation.
- Pier foundations: installation and testing of pier foundations.
- Excavations that require earth retention systems (sheeting and shoring).
- All retaining wall systems with unbalanced fill height:
    - Greater than eight (8) feet.
    - Between 4 to 8 feet with surcharge either from an adjacent structure or from a slope steeper than 3H:1V.
- Wood Construction (e.g. fabrication of high-load diaphragm etc.)
- Exterior Insulation and Finish System (EIFS). All EIFS applications, except those installed over a water-resistive barrier with a means of draining moisture to the exterior, or those installed over masonry or concrete walls.
- Sprayed Fire Resistant Material.
- Mastic and Intumescent Fire-Resistant Coatings.
- Smoke Control Systems.
- Special elements: Items of unique design or construction characteristics, or unusual materials, or with special installation requirements may be subject to special inspections when determined by the Building Official.

CHAPTER 4
PRE-CONSTRUCTION MEETINGS

A Special Inspections preconstruction meeting is required for every project over 3 stories in height that will be constructed under the special inspections program, to review the special inspections requirements of the construction project. The Building Official may require a pre construction meeting for other projects based on the design complexity.

The preconstruction meeting shall take place after structural review and approval of structural construction documents is completed by the Permitting Operations Division, after issuance of a building permit and prior to any construction activities.

The owner shall call DCRA to schedule the preconstruction meeting date and time. The preconstruction meeting location will be determined by the Building Official.

Construction team members who shall be represented and participate in the Special Inspections Program preconstruction meeting include:

- Owner (required for all projects)
- Architect of record (required for precast concrete building elements; optional for other building/foundation elements and soils/foundation elements)
- Structural engineer of record (required for building/foundation elements)
- Geotechnical engineer of record (required for soils/foundation elements)
- General contractor (required for all projects)
- Special inspections engineer of record (required for all projects)
- DCRA
- Other parties (inspection and testing agencies, subcontractors, etc.) as deemed appropriate by the owner or DCRA.

TOPICS

The owner shall bring a copy of the District-approved construction documents including the Permitting Operations Division-approved statement of special inspections to the preconstruction meeting. For projects with multiple buildings, a listing of the buildings, or an annotated site plan, with street addresses attached to the statement of special inspections, or separately provided, for use during construction. At the preconstruction meeting, a contact sheet with names, addresses, and telephone numbers of those in attendance shall be completed.

This 2012-SIP shall be used in the preconstruction meeting to review, discuss, clarify and approve elements of the special inspections program that apply to the project. It is recommended that, prior to the preconstruction meeting, all parties review the requirements of the District of Columbia Construction Code and the 2012-SIP, as they pertain to the specific project.

The following topics shall be discussed:

- **Statement of special inspections**. The scope of special inspections for the project, including required and elective special inspections.
- **Responsibilities**. The roles and responsibilities of each party.
- **Communication**. Communication channels between the District and the owner's representatives.

- **Construction project requirements**. Construction project requirements of the District of Columbia's Special Inspections Program, including construction methods, site safety and fire hazard prevention during the construction process.
- **Phased Construction**. Requirements for phasing or separation of permits, certificates of completion and occupancy requirements.

Statement of special inspections approval. DRCA shall approve the statement of special inspections during the preconstruction meeting. The statement of special inspections may be modified during the preconstruction meeting, if necessary.

CHAPTER 5
SPECIAL INSPECTIONS AND TESTING SERVICES

PROCEDURAL REQUIREMENTS

Owner to employ special inspectors. The owner shall be responsible for retaining an independent special inspections engineer of record and an inspection and testing agency to provide and conduct special inspections, materials testing, and related services, as described in the statement of special inspections and this 2012-SIP. Under no circumstances shall the general contractor or any of its subcontractors, executing the work subject to special inspections, be permitted to provide special inspections and testing services. As part of the statement of special inspections submitted for District approval and permit issuance, the owner shall furnish the District with the names of the special inspections engineer of record and the inspection and testing agency retained to provide special inspections and testing services.

- The special inspections engineer of record shall be a registered design professional retained by the owner to conduct special inspections and materials testing required by the District of Columbia Construction Code and this 2012-SIP, and shall be independent of the contractors executing the work subject to special inspections.
- The inspection and testing agency shall be retained by the owner, shall be an established and recognized agency, and shall be independent of the contractors executing the work subject to special inspections. To be approved by the Special Inspections Program, an inspection and testing agency shall meet the requirements of ASTM E 329 and shall be accredited by an accreditation body recognized by the District. The general contractor shall coordinate the scheduling of inspections. Inspection and testing agency personnel assigned to perform special inspection services shall be certified to appropriate levels to conduct the scope of services in the approved statement of special inspections.

District review and approval. The statement of special inspections is approved by both the Permitting Operations Division and the Special Inspections Section. The special inspections engineer of record and the inspection and testing agency both are subject to Special Inspections Section approval to conduct special inspections and materials testing. After District approval of the statement of special inspections, the special inspections engineer of record shall submit to the Special Inspections Section, one copy of resumes of all inspection and testing agency personnel assigned to the project, inspectors' certifications and accreditation certificates for laboratory facilities. The personnel and laboratories shall meet the requirements of the qualifications in this manual.

Changes in construction team. In the event that the registered design professionals of record, the general contractor, the special inspections engineer of record, the inspection and testing agency, or other organizations or individuals contracted for special inspections or testing services are changed during the course of the work, the owner shall submit an explanation for such change; identify and obtain District approval for the replacement party; and schedule a new meeting with the Special Inspections Section and the replacement party. The owner shall ensure that there is a timely transfer of information and responsibility to the replacement party.

Change of the architect of record, or change of the structural engineer of record, requires approval by the Permitting Operations Division, and may invalidate District-approved construction documents, requiring their resubmission for review and approval for new permits. Change of the geotechnical engineer of record requires approval by the Permitting Operations Division and the Special Inspections Section, and may invalidate the District-approved geotechnical report. Change of the general contractor requires notification to the Permitting Operations Division and the Special Inspections Section, and requires a new building permit if the general contractor is the building permit holder.

Change of the special inspections engineer of record or the inspection and testing agency requires approval by the Special Inspections Section and may invalidate further special inspections. In the event the inspection and testing agency has significant changes in management, ownership, personnel certifications or laboratory accreditation, reapproval by the Special Inspections Section is required.

ROLES AND RESPONSIBILITIES

Special inspections. The special inspections engineer of record shall conduct and certify special inspections of building components and testing of construction materials where such special inspections and materials tests are required by the District of Columbia Construction Code, the statement of special inspections and this 2012-SIPM.

Approved documents. Prior to conducting special inspections and materials testing, the special inspections engineer of record shall be responsible for verification of the following:

- **Building permit**. A building permit for the particular construction has been issued and a copy of the building permit is posted at the construction site.
- **District -approved construction documents**. A set of original District-approved construction documents is available at the construction site.
- **District-approved fabrication and erection docu**ments. District-approved fabrication and erection documents, which also bear the structural engineer of record review/approval stamp, are available at the construction site. Other approved fabrication and erection documents, which do not require District approval but which bear the structural engineer of record's review/approval stamp, are available at the construction site and a record copy of such documents has been received by the Special Inspections Section where required by this 2012-SIP.
- **Revisions to District-approved documents**. All revisions to District-approved construction documents, or District-approved fabrication and erection documents, or other documents, such as field change orders in response to requests for information, are in writing and have been approved, signed and sealed by the architect of record, the structural engineer of record, the geotechnical engineer of record, and the District, as appropriate. If such revisions do not bear the District stamp of approval, the special inspections engineer of record shall confirm with the Special Inspections Section whether the revisions are authorized or whether formal re-approval of revised documents by the Permitting Operations Division or the Special Inspections Section is required. It shall be the responsibility of the architect of record, the structural engineer of record, and the geotechnical engineer of record, as appropriate, to submit written revisions to the Special Inspections Section within seven working days of approval.

Deviations. The special inspections engineer of record and the special inspections engineer of record's representatives/field technicians shall not suggest direct or authorize the fabricator, erector or contractor to deviate from the contract documents, District –approved construction documents, or District-approved fabrication and erection documents, without the express written approval of the architect of record, the structural engineer of record, the geotechnical engineer of record and the Special Inspections Section, as appropriate.

Special inspection reports. The special inspections engineer of record shall report the results of testing and inspections, both approvals and rejections, to the Special Inspections Section according to the following procedures:

- **Seal and signature**. Each report shall bear a signature and seal of the special inspections engineer of record and shall include the correct building permit number and project address. Reports without project identification shall be rejected.
- **Submissions**. Both approval and rejection reports shall always be submitted to the general contractor, the owner, and the Special Inspections Section, and shall be submitted to the architect of record, the structural engineer of record, and the geotechnical engineer of record as appropriate. With the exception of situations where a code violation or safety hazard is discovered and must be reported immediately, all inspection and test reports shall be submitted to the Special Inspections Section within seven working days of the inspection or test conducted.
- **Compliance**. Unless deficiencies are discovered or code violations are revealed during the conduction of special inspection and testing services, special inspection and testing reports shall indicate that the specified work has been inspected and found to be in compliance with District-approved documents.
- **Deficiencies**. Deficiencies shall be reported to the general contractor for correction and sent to the Special Inspections Section. Deficiency reports shall contain the details describing the nature and specific location of the deficiency and include a description of the action recommended by the architect of record, the structural engineer of record or the geotechnical engineer of record, as appropriate, to correct it. After correction, reinspection is required. At the completion of a project, all recorded problems or deficiencies shall be documented as having been corrected and approved by the appropriate registered design professionals.
- **Completion letters**. Upon completion of special inspections and testing for a particular construction discipline, such as "structural steel", the special inspections engineer of record may, after review by the appropriate registered design professionals, submit a completion letter to the Special Inspections Section as a part of the final report of special inspections.
- **Final report of special inspections**. Upon completion of special inspections and testing for all construction elements subject to special inspections, the special inspections engineer of record shall, after review by the appropriate registered design professionals, submit a final report of special inspections to the Special Inspections Section for approval.

Code violations. In the event that the special inspections engineer of record or the special inspections engineer of record's representatives/field technicians observe a condition during the conduct of special inspections and testing services that constitutes a violation of the District of Columbia Construction Code the special inspections engineer of record shall immediately notify the appropriate registered design professionals and the Special

Inspections Section for resolution, followed with a written report submitted to the Special Inspections Section within seven working days.

Construction site safety violations. In the event that the special inspections engineer of record or the special inspections engineer of record's representatives/field technicians observe a condition that poses an immediate or serious safety hazard to construction site workers or the general public, the special inspections engineer of record shall immediately notify the general contractor and the Special Inspections Section for resolution.

PERSONNEL QUALIFICATIONS

Direct supervision. The inspection and testing agency personnel assigned to conduct special inspections in the District of Columbia shall work under the supervision of an approved registered design professional with demonstrated proficiency in the construction discipline to be evaluated.

Certification. Except for individuals who are registered design professionals, inspection and testing agency field inspection personnel shall be certified by examination through WACEL, the American Concrete Institute, the Post Tensioning Institute, the American Welding Society, the American Society for Nondestructive Testing, the National Institute for Certification in Engineering Technologies, the International Code Council or other organizations whose programs are recognized by the District. Inspection and testing agency personnel shall be reviewed and approved by the Special Inspections Section on a case-by-case basis. The inspection and testing agency personnel shall conduct only those special inspection and materials testing services in which they have demonstrated competency through an approved certification or registration program. Different levels or types of special inspections require different levels or types of expertise by the inspector, and competency certifications shall match the tasks. Tests or inspections conducted by unqualified or unapproved inspection and testing agency personnel shall be automatically rejected, and further construction work shall not proceed until reinspections are conducted and approved.

Unusual functions. In the event there is no certification program applicable to a specific special inspection function, the special inspections engineer of record shall submit a signed statement attesting to the competency of inspection and testing agency personnel and identifying the basis upon which such statement is made.

LABORATORY ACCEPTANCE STANDARDS

All laboratory facilities conducting special inspection and materials testing services in the District of Columbia shall meet the requirements of ASTM E 329, ASTM D 3740, and ASTM C 1077 as applicable and shall be individually accredited by organizations such as WACEL, the American Association for Laboratory Accreditation, the National Institute of Standards and Technology, the National Voluntary Laboratory Accreditation Program, or other organizations whose programs are recognized by the District. Where an inspection and testing agency has multiple offices and laboratory facilities conducting special inspection and materials testing services in the District, each laboratory to be utilized on construction projects shall be individually accredited and meet the requirements of ASTM E 329, ASTM D 3740, and ASTM C 1077, as applicable.

Laboratories shall be reviewed and approved by the Special Inspections Section on a case by case basis and shall conduct only those tests and analyses for which accreditation has been obtained. The special inspections engineer of record shall approve onsite laboratories provided the on-site laboratory demonstrates that it has (and follows) an effective quality control program; equipment calibration program; and a technician certification program of an accredited laboratory.

CHAPTER 6 THE RESPONSIBILITIES OF THE GENERAL CONTRACTOR AND THE OWNER

The Owner/ Contractor, before commencement and/or during construction, is responsible for satisfying requirements of the special inspections program. The responsibilities include, but are not limited to, the following:

RESPONSIBILITIES

General Contractor Responsibilities

1. Site superintendent is present during the preconstruction meeting. The Contractor shall notify the Special Inspections Section regarding any change of site superintendent.
2. Subcontractors for specialized works such as bridges, prestressing, shotcrete, retaining walls are represented during the preconstruction meeting.
3. Provide DCRA with an Affidavit (Conflict of Interest) from the owner stating that the owner has retained a DCRA approved Special Inspections Agency, independent of the contractor executing the work subject to special inspections.
4. Site address and Building Permit are visible.
5. Trailer permit, if applicable, has been obtained, displayed visibly and trailer has been inspected.
6. District-approved construction documents including, but not limited to, design drawings, shop drawings, specifications, concrete mix design, mortar/ grout mix design, masonry product data, geotechnical report, Special Inspection Manual, are available at the construction site.
7. Site is made accessible.
8. Erosion and sediment control devices are installed and maintained.
9. Assure a proper curing box is available, if applicable.
10. Revisions, including construction field revisions, to the construction documents are approved by the Permitting Operations Division before implementation of the revision. The original District-approved revised documents are maintained at the construction site.
11. Copy DCRA Special Inspections Section on all requests for information affecting special inspections submitted to the design professional of record.
12. Ensure that the SIER maintains a copy of the updated deficiency list in the field from the beginning to the end of special inspections.
13. Ensure the full-time presence of an inspector/technician when work requires continuous inspection, such as concrete construction, soil compaction etc.
14. Coordinate with the owner and report to DCRA any incident or changes in site conditions that will directly or indirectly compromise the integrity of the structure.
15. Confirm that the final report of special inspections has been submitted to DCRA and approved before scheduling building inspections (wall concealment, ceiling concealment, building final)
16. Build in accordance with the District-approved plans, specifications, other applicable documents and building and industry codes.
17. Maintain safe environment in accordance with construction documents and District and OSHA requirements.

Owner Responsibilities

Ensure that the Statement of Special Inspections is completely filled out and submitted to plan review at the time of plan submission.

CHAPTER 7
SOILS AND FOUNDATIONS

All structural foundation elements, including spread and continuous footings, mats, piles, caissons, and structural fills (earthwork), including wall backfill, shall be constructed to the requirements, specifications and requirements shown on the approved construction documents and/or as determined by the District-approved geotechnical report requirements for the project. Required inspection and testing for earthwork, foundations, and related work shall be performed by the GER and/ or the SIER. Inspection and testing shall be performed by registered professional engineer or certified technicians working under the direction of a registered professional engineer.

Soils and foundations components. The following elements and components of soil related conditions or foundation systems are subject to special inspections:

Shallow footings and foundations. Soils and building foundation components when either of the following conditions exists:

- **Problem soils**. The building footprint is located in a problem soils area, or as indicated by the District-approved geotechnical report; or
- **Compacted fill material**. The bearing material under the building footprint consists of compacted structural fill, except when fill is less than 1'-0" in total depth.
- **Controlled low-strength material (CLSM).** The bearing material under the building footprint consists of controlled low-strength material, except when fill is less than 1'-0" in total depth.

Deep foundations. Building foundation components for the following systems:

- Pile foundations of all buildings.
- Specialty piles and piers, including micropiles, geopiers or other systems. The statement of special inspections shall specifically include the special inspections required.

Foundation bearing loads. Foundation materials, when an allowable load-bearing support capacity greater than 3,000 pounds per square foot is required by the building's foundation design, or is specified by the responsible registered design professional..

Geotechnical report and investigations. In problem soils areas, the geotechnical report as required by DCBC-1802.2 and DCBC-1802.6, shall be prepared, signed and sealed by the geotechnical engineer of record and shall be submitted to the Permitting Operations Division for approval prior to permit issuance. In non-problem soils areas, the geotechnical investigations and recommendations shall be submitted to the Permitting Operations Division for approval prior to permit issuance. After approval, one copy of the District approved geotechnical report shall be returned for use on the construction site. District approved documents shall be used by the special inspections engineer of record to conduct special inspections and tests during construction.

FABRICATION AND ERECTION DOCUMENTS

Preparation of fabrication and erection documents. A registered design professional with experience in the design of deep foundation elements shall prepare, sign and seal fabrication and erection documents for pile and pier foundations. Fabrication and erection documents for cast-in-place concrete shallow foundations shall comply with IBC Chapter 17.

Review and approval. Prior to construction, the soils and foundations fabrication and erection documents shall be submitted to the geotechnical engineer of record and the structural engineer of record, as appropriate, for approval. The general contractor shall submit two sets of the geotechnical engineer of record/structural engineer of record-approved fabrication and erection documents to the Special Inspections Section for approval. After approval, one set of District-approved fabrication and erection documents shall be returned for use on the construction site. The special inspections engineer of record shall use District approved documents to conduct special inspections and tests during construction.

SPECIAL INSPECTIONS AND TESTS

Soils. The geotechnical engineer of record shall conduct special inspections of soils in accordance with IBC-1704.7 Soils and IBC-1803 Excavation, grading and fill. Special inspections shall be conducted to determine compliance with the District-approved geotechnical report and the District-approved construction documents, and shall include:

- **Subgrade**. Subgrade shall be specially inspected for compatibility of bearing material and ground water conditions with the District-approved geotechnical report, prior to construction of footings and slabs.
- **Fill material**. Fill material shall be specially inspected for compliance with District approved structural fill specifications prior to, during, and following its placement in each lift, for structural fill 1'-0" or greater in total depth. Fill material less than 1'-0" in total depth does not require special inspection, nor need it comply with an approved report, provided it complies with the provisions of IBC-1803.5 Exception for materials and compaction, unless otherwise specified.
- **Compaction**. Special inspections of the compaction process shall be conducted to verify compaction is not less than 90% of maximum dry density at optimum moisture content in accordance with ASTM D1557 and DCRA approved construction documents.
- **Controlled low-strength material**. Special inspections shall be conducted to comply with the provisions of an approved report, in accordance with IBC-1803.6.

Deep foundations. The geotechnical engineer of record shall conduct special inspections of deep foundations to determine their in-place load-bearing capacity. Special inspections shall include:

- **Piles.** Special inspections as required by IBC-1704.8 Pile foundations and IBC-Table 1704.8 Required verification and inspection of pile foundations, and IBC-1808 Pier and pile foundations, IBC-1809 Driven pile foundations, IBC-1810 Cast-in-place concrete pile foundations, IBC-1811 Composite piles, and IBC-1812 Pier foundations, as appropriate. Special inspections shall include inspection of piles before, during, and after driving. Inspection reports shall contain an evaluation of the pile capacity based on driving resistance, and dynamic or static pile testing. Pile driving records shall be submitted to the Special Inspections Section prior to placement of pile caps.
- **Specialty piles and piers**. Special inspections as required by IBC-1704.8 Pile foundations and IBC-Table 1704.8 Required verification and inspection of pile foundations, and IBC-1808 Pier and pile foundations and IBC-1810 Cast-in-place concrete pile foundations, as appropriate. Special inspections shall be as required by the statement of special inspections. Special inspections for micropiles shall include pile diameter and depth, grout testing, reinforcement, and grout placement.

Shallow footings and foundations. The special inspections engineer of record or the geotechnical engineer of record shall conduct special inspections of footings and foundation systems, including shallow foundations, foundation walls, mats and slabs. Special inspections of cast-in-place concrete shall be conducted, to include monitoring the placement of concrete, concrete reinforcement, and the dimensions, shapes and locations of footings, slabs, and foundation walls.

SOILS-RELATED DEVIATIONS AND REVISIONS

In the event that field conditions vary materially from the District-approved geotechnical construction documents, the special inspections engineer of record or the geotechnical engineer of record shall notify the general contractor, and the following shall apply.

Preparation of revisions. The geotechnical engineer of record shall prepare, sign and seal revisions to the District-approved geotechnical construction documents if on-site soil or ground water conditions vary materially from those presumed to exist based on the initial subsurface exploration and as indicated in the District-approved geotechnical construction documents. The geotechnical engineer of record shall coordinate revisions to the District approved geotechnical construction documents and District-approved fabrication and erection documents with the structural engineer of record responsible for structural design of foundations, and a registered design professional responsible for deep foundations if applicable. The structural engineer of record, and the registered design professional responsible for deep foundations if applicable, shall prepare, sign and seal revisions to the District-approved construction documents and District-approved fabrication and erection documents.

District approval. Revisions to the District-approved geotechnical report, District approved geotechnical construction documents, and District-approved fabrication and erection documents shall bear the seal and signature of the appropriate registered design professionals and shall be submitted to the Permitting Operations Division for construction in problem soils areas, or to the Permitting Operations Division for construction in non-problem soils areas, as appropriate, for approval prior to continuation of construction. The Special Inspections Section Inspector shall determine if the construction can proceed, pending approvals by the Permitting Operations Division. After approval, one set of District-approved documents shall be returned for use on the construction site. District-approved documents shall be used by the special inspections engineer of record to conduct special inspections and tests during construction.

COMPLETION OF SOILS AND FOUNDATIONS CONSTRUCTION

Soils. Upon completion of soil-related special inspections, the geotechnical engineer of record may, after review by the structural engineer of record as applicable, submit a completion letter to the Special Inspections Section.

Deep foundations. Upon completion of all piling and caisson deep foundations, including specialty piling and piers, the geotechnical engineer of record may, after review by the structural engineer of record as applicable, submit a completion letter to the Special Inspections Section.

Shallow footings and foundations. Upon completion of structural special inspections of footings and foundations, the special inspections engineer of record or the geotechnical engineer of record, as applicable, may, after review by the structural engineer of record and the geotechnical engineer of record as applicable, submit a completion letter to the Special Inspections Section.

CHAPTER 8
CAST-IN-PLACE CONCRETE

GENERAL

The requirements of this chapter, and IBC-1704.4 and IBC-Table 1704.4 shall apply when construction includes cast-in-place concrete and concrete elements. Concrete elements as listed below shall be subject to special inspections.

Elements. All structural elements of cast-in-place concrete, including reinforced, prestressed, or post-tensioned concrete, mat foundations, and concrete topping on stay-in- place steel decking, both composite and noncomposite designs, except as listed below.

Exceptions: The construction shall be on undisturbed and stable earth, rock or non-problem soil. Then, as exempted in IBC-1704.4 Concrete construction, special inspections are not required for:

- Isolated spread concrete footings of buildings of three stories or less in height.
- Continuous concrete footings supporting walls of buildings three stories or less in height that are fully supported on earth or rock where:
    - The footings support walls of light-frame construction;
    - The footings are designed in accordance with IBC-Table 1805.4.2; or
    - The structural design of the footing is based on a specific compressed strength f_c', no greater than 2,500 pounds per square inch (psi) (17.2 MPa), regardless of the compressive strength specified in the construction documents or used in the footing construction.
- Nonstructural concrete slabs on grade (including prestressed slabs) supported directly on the ground; where the effective prestress in the concrete is less than 150 psi (1.03MPa).
- Concrete foundation walls built in accordance with IBC-Table 1805.5(5)

Construction loads. The general contractor shall coordinate construction operations so that at all times the dead loads, live loads and construction loads delivered to the building while it is under construction shall be within the capacity of the building to carry such loads. In addition, no structural loads shall be imposed on any vertical load carrying member which is less than seven days old, unless the concrete strength criteria established by the structural engineer of record for carrying such loads is satisfied.

Posting of concrete placement schedule. As construction proceeds, the general contractor shall post the updated concrete placement schedule, which shall indicate building floor level, placement number, and date of placement, on the door of the general contractor field office. This schedule shall be available for use in case of emergency by the District of Columbia Fire and Rescue Department.

FABRICATION AND ERECTION DOCUMENTS

Seal and signature requirements. The following fabrication and erection documents shall be prepared, signed and sealed by registered design professionals with experience in the requisite disciplines:

- Concrete formwork and shoring designs.

- Concrete formwork stripping and reshoring schedules.
- Tendons to be post-tensioned.

Formwork, shoring and reshoring design requirements. The fabrication and erection documents for the concrete formwork, shoring and reshoring of structural concrete slabs, beams, walls, and columns shall include:

- Concrete formwork and shoring design calculations, construction details and placement plans.
- Formwork and shoring for horizontal concrete construction (slabs, beams and girders) shall include concrete dead loads, formwork loads, and construction live loads.
- Shoring for concrete frames shall be designed to meet the structural engineer of record's requirements.
- Formwork for vertical concrete construction (walls and columns) shall include lateral concrete pressures and rate of placement assumed or required for walls and columns.

Shoring and reshoring design calculations, placement plans and reshoring procedures for horizontal concrete construction (slabs, beams and girders) shall include:

- Number of levels of shores and reshores;
- Loads to be delivered to the shores and reshores at each level;
- Shore capacities and reshore capacities;
- Construction loads to be delivered to the building at each level;
- Time-dependent strengths of the building components required for the delivered construction loads and assumed construction schedules.
- Temporary erection shoring for composite construction (concrete slab/steel beam, concrete slab/steel joist, or concrete slab/wood joist), or for erection of structural steel shall be designed to meet the structural engineer of record's requirements.
- Necessary construction schedules. The general contractor shall coordinate the construction schedule with the registered design professional responsible for formwork, shoring and reshoring design, and with the structural engineer of record.

Review and approval. Prior to concrete construction and formwork erection, as appropriate, the fabrication and erection documents listed below shall be submitted to the structural engineer of record, for approval for compliance with the District-approved construction documents and in accordance with the following requirements:

- Concrete formwork and shoring designs, and formwork stripping and reshoring designs and schedules and verification of the capacity of the building components, exclusive of the formwork and shoring, to carry the construction loads delivered to the building.
- Steel reinforcement (non-prestressed cast-in-place concrete).
- Steel reinforcement and tendons (prestressed or post-tensioned cast-in-place concrete).
- Concrete mix designs, including any accelerators or other admixtures, for each class of concrete to be used.

The general contractor shall submit two sets of structural engineer of record-approved cast-in-place concrete fabrication and erection documents, including concrete mix designs, reinforcement, and concrete formwork, shoring and reshoring designs, to the Special Inspections

Section for approval. After District approval, one set of District approved fabrication and erection documents shall be returned for use on the construction site. The special inspections engineer of record shall use District-approved documents to conduct special inspections and tests during construction.

Exceptions: Unless required by project specifications or the structural engineer of record, District approval is not required for the following items. For these items, one set of structural engineer of record-approved fabrication and erection documents shall be available on the job site for use by the special inspections engineer of record to conduct special inspections and tests during construction, and one set shall be submitted to the Special Inspections Section for record purposes.

- Steel reinforcement for non-prestressed cast-in-place concrete.
- Concrete formwork for walls 10'-0" in height or less, and which does not support workmen scaffolding at heights greater than 10'-0" above any adjacent surface.
- Concrete formwork for columns 15'-0" in height or less, and which does not support workmen scaffolding at heights greater than 10'-0" above any adjacent surface.

SPECIAL INSPECTIONS AND TESTS

Special inspections. The special inspections engineer of record shall conduct special inspections and materials tests in accordance with IBC-1704.4 Concrete construction, IBC-Table 1704.4 and the requirements of the approved statement of special inspections.

P**articular elements**.

Concrete formwork, shoring and reshoring erection. Prior to placement of concrete, the special inspections engineer of record shall verify that:

- Formwork materials, cleanliness, size, and installation conform to District-approved formwork fabrication and erection documents.
- Shoring and reshoring is installed in conformance with the District-approved
- Documents and IBC-Table 1704.4 Item 11 required verification and inspection of concrete construction, inspection of concrete formwork, shoring and reshoring requires periodic special inspection of formwork, shoring and reshoring. Inspection reports shall be submitted to the Special Inspections Section within three working days of each inspection.

Reinforcing steel. The special inspections engineer of record shall conduct special inspections of steel reinforcement, in compliance with District-approved construction documents and approved fabrication and erection documents, including welding of reinforcement of the structural seismic-resisting system.

- Reinforcing steel placement requires periodic special inspection.
- Welding of steel reinforcement requires continuous or periodic special inspection, depending upon the use of the reinforcing steel, in accordance with IBC-Table 1704.3 Item 5b.
- The special inspections engineer of record shall conduct periodic special inspections to verify weldability of steel reinforcement other than ASTM A 706.
- The special inspections engineer of record shall conduct continuous special inspections of welding for reinforcement resisting shear, flexural and axial loads in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement.
- Periodic special inspection of welding is required for other reinforcement.

- Embedded bolts, anchors, dowels and imbeds securely fastened in place require periodic special inspection prior to and during concrete placement and consolidation.

Tendons to be post-tensioned. The special inspections engineer of record shall conduct special inspections of tendons to be post-tensioned, in compliance with District-approved construction documents and approved fabrication and erection documents, including:

- Periodic special inspection of tendon placement, to include tendon size and strength, chair height, tendon profile, tendon snaking elimination, horizontal ties between chairs and condition of sheathing.
- Continuous special inspection of grouting, consolidation and reconsolidation of bonded tendons.
- Continuous special inspection and monitoring of tendon stressing operations, in compliance with project specifications. Stressing of tendons shall not start before the specified minimum strength of field-cured test cylinders has been achieved and verified by the special inspections engineer of record and approved by the structural engineer of record. Elongation records shall be made and checked against project specifications. Tendon failures or tendon elongations not in compliance with project specifications shall be rejected, and the structural engineer of record shall make recommendations in writing for remedial actions.

Concrete. The special inspections engineer of record shall:

- Verify use of proper concrete design mix.
- Monitor placement of concrete.
- Conduct special inspections and testing listed in IBC-Table 1704.4. Continuous monitoring of concrete delivery shall be required at the point of discharge from trucks/batch plant, and at the point of deposit/consolidation of concrete.

ON SITE CONCRETE BATCH PLANT APPROVALS:

Prior to the manufacture of concrete, the SIER shall inspect the plant for conformance to standards, outlined in this section, and shall verify the accuracy of scales, before they are used. Batch plant operator must have ACI concrete batcher and concrete technician certification to operate the plant.

General Site Requirements

There shall be a 20 feet wide access road. The roadway should be adequate to prevent delivery trucks from contaminating stockpiles. A mud mat, thick enough to prevent contamination of stockpiles shall be present. There shall be barricades and warning devices to prevent workers from entering the working radius of the scraper boom Stockpiles shall be separated by walls, extending to the outside perimeter of the boom radius. These walls shall have a 45º minimum angle from the leading edge of the stock pile .All other requirements of the current version of ASTM C 94, and ACI 304 shall be met.

CONCRETE TESTING

Concrete shall be tested in accordance with this section, and with IBC-1905.6 Evaluation and acceptance of concrete.

Testing required. Tests for cast-in-place concrete material properties and attained strength shall comply with the following:

Test cylinders. Concrete samples for strength testing (both laboratory-cured cylinders and field-cured cylinders) shall be taken in accordance with ASTM C 31 Concrete test cylinders shall be 6 x 12 inches in size, with two 6 x 12 inch cylinders cast for each test.

Exception: Concrete test cylinders may be 4 x 8 inches in size, subject to the following conditions:

- The use of alternative concrete test cylinders shall be specified by the structural engineer of record on a case by case basis.
- The use of alternative concrete test cylinders shall be considered by the District on a case by case basis Three 4 x 8 inch cylinders shall be cast for each test.

Frequency of sampling. Samples for strength tests of each class (concrete mix design) shall be taken in accordance with IBC-1905.6.2 Frequency of testing. Samples shall be taken not less than once per day, nor less than once for each 150 cubic yards of concrete, nor less than once for each 5,000 square feet of surface area for slabs or walls. Additional test cylinders for strength tests shall be cast if required by the architect of record, the structural engineer of record, or District-approved documents. Additional cylinders to be field-cured shall be required to evaluate strengths of concrete prior to removal of shores and concrete formwork, prior to stressing of post-tensioning tendons, loading of vertical building elements, erection of structural steel, and adequacy of concrete curing and protection methods during cold weather concreting conditions.

Laboratory-cured cylinders. Cylinders for strength tests for acceptance of concrete shall comply with this section, and with IBC-1905.6.3 Laboratory-cured specimens. Cylinders for strength tests shall be cast, stored, transported and laboratory-cured in accordance with ASTM C 31. The testing shall be done at 28 days or the time designated on the District approved documents for determination of specified compressive strength of concrete, f'c, if different from 28 days. Concrete tests shall be in accordance with ASTM C 39. Test results for multiple samples shall be individually reported. Test results shall not be averaged together.

Field-cured cylinders. Field-cured cylinders, to evaluate strengths of concrete prior to removal of concrete formwork and shoring/reshoring, prior to stressing post-tensioning tendons, and to determine adequacy of curing and protection of concrete during cold weather, shall comply with this section, and with IBC-1905.6.4.Field-cured cylinders shall be cured as closely as possible to the location of placement of the concrete pour they represent, and be exposed as nearly as possible to the same temperature and moisture environment, in accordance with ACI 318 and ASTM C 31.Cylinders may be fabricated on the ground or on the slab, and moved to the curing location no more than 30 minutes after fabrication.

If fabricated on the ground, cylinders shall be placed in a temporary open storage location, protected by no more than insulated blankets, remain undisturbed for a minimum of 16 hours but no more than 24 hours after molding, and then be relocated into or on the structure as closely as is practicable to the concrete they represent.

If molded on the slab, cylinders shall be placed into or on the structure as closely as is practicable to the concrete they represent immediately after molding. Equivalency may be achieved by storing uncapped cylinders on or immediately adjacent to the structural concrete placement as soon as practical after casting (and until six hours or less prior to testing), and subjecting them to the same temperature and moisture loss controls as the structure itself. Test cylinders shall be protected from cold weather and cured in the same manner as the concrete they

represent. Under no circumstances shall field cured cylinders be subjected to a curing environment that is better than the concrete they represent, such as placement within a temperature and humidity controlled container. Concrete tests shall be in accordance with ASTM C 39.

Test results for multiple samples shall be individually reported. Test results shall not be averaged together. Test results shall be considered satisfactory if the strength of all cylinder tests equal or exceed the strength required at the age of testing.

Low-strength concrete test results. Investigation of low-strength concrete shall be in accordance with this section, and with IBC-1905.6.5 Low-strength test results. The following procedures shall apply when test results do not comply with the acceptance criteria of ACI 318 for concrete strength.

Data and recommendations. The special inspections engineer of record shall submit to the Special Inspections Program a copy of any records pertaining to under-strength concrete, with the written recommendations of the structural engineer of record.

Nondestructive testing. If nondestructive testing is recommended by the structural engineer of record to evaluate or confirm the in-situ concrete strength, the Special Inspections Section shall only accept testing by concrete cores obtained and tested in accordance with ASTM C 42. Condition of cores, and tested not less than two days nor more than seven days after coring, or by penetration resistance in accordance with ASTM C 803 and calibrated for the particular concrete mix. The impact rebound hammer (ASTM C 805) method of testing shall not be approved.

CONCRETE FORMWORK STRIPPING AND RESHORING

Approval required. Specific Special Inspections Section approval is required prior to removal of concrete formwork and shoring, and installation or removal of reshores. Removal of shores, formwork stripping, and installation of reshores shall conform to the District approved fabrication and erection documents.

Low-strength concrete. When field-cured concrete strength test results do not meet formwork and shoring removal requirements, the registered design professional who designed the concrete formwork and shoring shall make a recommendation, either to allow stripping to proceed, or to postpone stripping until specified concrete strengths are attained, for approval by the structural engineer of record

Tendon elongation records. When structural members to be stripped are of post tensioned concrete, tendon elongation records shall be approved by the structural engineer of record In the event that tendons are broken, tendon elongations do not meet project specifications, or other deficiencies occur, the registered design professional who designed the post-tensioned tendons shall address the case and make a recommendation, for approval by the structural engineer of record

COLD-WEATHER CONCRETING

The requirements of this section shall apply when air temperature has fallen to or is expected to fall below 40°F during the protection period of freshly-placed concrete. The general contractor

shall make specific provisions to continuously protect the concrete during cold weather periods following provisions of ACI 306 The SIER shall verify adherence to the following requirements:

- **Minimum temperature of concrete**. All concrete (slabs, columns, walls, beams, footings, etc.) shall be maintained per Table 3.1 of ACI 306.
- **Maximum temperature in enclosures**. If the area is enclosed, the temperature in the enclosure shall be monitored so that it does not exceed 104°F, or as otherwise specified by the structural engineer of record. Proper moisture levels shall be maintained at all times.
- **Environment of field-cured cylinders**. When cylinders are fabricated for acceptance testing, additional cylinders shall be made to be field-cured for purposes of determining adequacy of protection and curing Field cured concrete cylinders shall be cured in the identical environment, and the least favorable curing conditions, as the structural members they represent. Each set of field cured cylinders shall remain in the exact curing environment of the structural members they represent for 100 percent of the minimum curing time required by the structural engineer of record prior to transport to the approved testing laboratory for compressive strength testing.
- **Temperature records**. The special inspections engineer of record shall record ambient temperature, air temperature under slab (when applicable), and concrete temperatures at regular time intervals on all concrete until 72 cumulative hours of internal concrete temperatures above 50°F are achieved, or until the average ambient temperature rises above 40°F for more than three successive days. Temperature readings shall be taken by personnel of the special inspections engineer of record, using tamper-resistant devices. Concrete temperature readings shall be taken at a minimum of four locations along the edge of the slab being monitored. The Special Inspection Program may designate additional locations if the concrete placement is unusually large. Temperature readings and appropriate data shall be recorded on a temperature log sheet which shall be attached to each stripping letter to facilitate approval of the stripping request.
- **Frequency of readings**. Periodic readings of temperatures are required to verify adequacy of curing and protection methods. During the season when temperatures are not within the "cold weather concreting" conditions, high and low readings of concrete temperatures shall be conducted once for each 24-hour period. Such readings shall be labeled, "not cold weather". During "cold weather concreting" conditions, the special inspections engineer of record shall monitor ambient temperature, air temperature under slab, and concrete temperatures at regular time intervals for the specified duration of temperature controlled curing. The concrete curing time begins when the last delivery of concrete is deposited into the formwork, with temperature monitoring beginning immediately after concrete placement and finishing is complete and continuing until the cumulative duration of satisfactory curing is achieved. If instantaneous temperature readings only are recorded, there shall be not less than six recordings per 24-hour period (at 4-hour intervals). If there are less than six recordings per 24-hour period, recordings shall include the instantaneous temperature and also include both minimum/maximum temperatures reached during the previous recording period, with not less than two recordings per 24-hour period (12-hour intervals). In all cases, if the temperature reading(s) indicate a minimum concrete temperature below 50°F, then that period of time between readings cannot be included in the required curing duration.
- **Use of automatic recorders**. Automatic temperature monitoring and maturity metering devices may be used only to verify the temperature data

- **Deficiencies.** The general contractor shall adjust cold-weather concreting procedures and protective measures if temperature readings indicate deficiencies in protective measures.
- **Testing of field-cured cylinders for curing**. For cold-weather concreting, testing of field-cured cylinders is required, to verify adequacy of curing and protection measures. The testing shall be done at 28 days or the time designated on the District-approved documents for determination of specified compressive strength of concrete, f'c, if different from 28 days. Cylinders cured in the field for purposes of determining formwork and shoring removal may be used to satisfy this requirement.

HOT-WEATHER CONCRETING

The requirements of this section shall apply when air temperature has risen to or expected to exceed 90°F during the protection period of freshly-placed concrete. The general contractor shall make specific provisions to continuously protect the concrete during hot weather periods following provisions of ACI 305. The SIER shall verify adherence to the requirements In ACO 305 and IBC 1905.13.

COMPLETION OF CAST-IN-PLACE CONCRETE CONSTRUCTION

Upon completion of cast-in-place concrete construction, the special inspections engineer of record may, after review by the structural engineer of record, submit a completion letter to the Special Inspections Section.

CHAPTER 9
PRECAST CONCRETE

GENERAL

Required verification and inspection of concrete construction, erection of precast concrete members, shall apply when construction includes precast concrete building elements.

Inspection of precast concrete fabricators and fabrication procedures. When precast concrete elements are fabricated off-site, the special inspections engineer of record shall conduct special inspection of the precast concrete fabricator and fabrication procedures, as required by IBC-1704.2 Inspection of fabricators, for all precast concrete elements that are themselves subject to special inspections. The report of special inspection of the fabricator and fabrication procedures shall be submitted to the Special Inspections Section.

Certification. The fabricator may demonstrate to the special inspections engineer of record that the requirements of IBC-1704.2 Inspection of fabricators have been met by furnishing Precast/Prestressed Concrete Institute Plant Certification in the appropriate category. The special inspections engineer of record may inspect the precast plant at appropriate intervals to verify that materials, methods, products, and quality control comply with project specifications, District-approved fabrication and erection documents, and PCI MNL-116 or PCI MNL-117S, as applicable.

Procedures implementation. The special inspections engineer of record shall state in writing that the fabricator has a documented and implemented quality control program. Verification may be on a job basis or by inspection within the previous twelve months.

Certificate of compliance. At the completion of fabrication, the fabricator shall submit a certificate of compliance to the Special Inspections Program.

Precast concrete elements cast off-site. All architectural and structural precast concrete building elements manufactured off-site, except miscellaneous cast stone items such as sills, coping, pavers, etc., or as otherwise approved.

Precast concrete elements cast on-site. All architectural and structural precast concrete building elements manufactured on-site, including tilt-up concrete wall panels, except miscellaneous cast stone items such as sills, coping, pavers, etc., or as otherwise approved.

FABRICATION AND ERECTION DOCUMENTS

Preparation of fabrication and erection documents. A registered design professional with experience in the design of precast concrete structures shall prepare, sign, and seal fabrication and erection documents for precast concrete building elements, including but not limited to: design drawings and calculations, connection details, design of lifting inserts, rigging requirements, and erection bracing. The concrete mix designs shall be approved by the registered design professional responsible for preparation of precast concrete designs. Documents for site-

cast precast concrete shall also include, but are not limited to: element fabrication, form removal, storage and transportation.

Review and approval. Prior to fabrication and erection of precast concrete elements, the precast concrete fabrication and erection documents, including the concrete mix designs, shall be submitted to both the architect of record and the structural engineer of record, for approval for compliance with the architectural and structural design of the building and the District approved construction documents. The general contractor shall submit two sets of the architect of record/structural engineer of record-approved precast concrete fabrication and erection documents, including the concrete mix designs, to the Special Inspections Section for approval. After District approval, one set of District-approved concrete mix designs and District-approved fabrication and erection documents shall be returned for use on the construction site. The special inspections engineer of record shall use District-approved documents to conduct special inspections and tests during construction.

SPECIAL INSPECTIONS AND TESTS

The special inspections engineer of record shall conduct special inspections of precast concrete building elements during fabrication and erection as required by IBC-1704.4 Concrete construction, and IBC-Table 1704.4 Item 9 Required verification and inspection of concrete construction, erection of precast concrete members for conformance with District-approved documents.

Fabrication of precast concrete elements cast on-site. During on-site fabrication of precast concrete elements, the special inspections engineer of record shall verify the following:

Concrete. Concrete complies with the District-approved concrete mix

- Compressive strength of field-cured cylinders. The compressive strength of field-cured cylinders satisfies minimum strength requirements of the District-approved construction documents and the lifting requirements and lifting insert specifications of the District approved fabrication and erection documents.
- Reinforcing steel. Reinforcing steel, including lifting inserts, is installed in accordance with District-approved documents.

Precast concrete erection: During erection of precast concrete elements, the special inspections engineer of record shall verify the following:

- Assembly. Precast concrete elements are lifted, assembled and braced in accordance with District-approved fabrication and erection documents.
- Welders. Welders and weld inspectors are certified in accordance with AWS D1.1, Chapter 5, Part C.
- Connections. All welded connections in the structural frame are in accordance with District-approved documents and the applicable sections of AWS D1.1, SJI specifications, AISC specifications, and the District of Columbia Construction Code.

COMPLETION OF PRECAST CONCRETE CONSTRUCTION

Upon completion of architectural and structural precast concrete construction, the special inspections engineer of record may, after review by the architect of record and the structural engineer of record, submit a completion letter to the Special Inspections Section.

CHAPTER 10
WOOD

GENERAL

The requirements of this chapter, and IBC-1704.6 Wood construction, shall apply when construction includes wood building elements.

Inspection of wood fabricators and fabrication procedures. The special inspections engineer of record shall conduct special inspection of the wood fabricator and fabrication procedures, as required by IBC-1704.2 Inspection of fabricators, for all wood fabricated assemblies that are themselves subject to special inspections. Glue-laminated members and sandwich panels shall bear the mark of an approved agency. The report of special inspection of the fabricator and fabrication procedures shall be submitted to the Special Inspections Program.

Certification. The fabricator may demonstrate to the special inspections engineer of record that the requirements of IBC-1704.2 Inspection of fabricators have been met by furnishing evidence of compliance with the WTCA QC program, or its equivalent.

Procedures implementation. The special inspections engineer of record shall state in writing that the fabricator complies with the fabrication and quality control procedures outlined above. Verification may be on a job basis or by inspection within the previous 12 months.

Certificate of compliance. At the completion of fabrication, the fabricator shall submit a certificate of compliance to the Special Inspections Section.

Wood elements. The following wood elements are subject to special inspection:

- Structural glue-laminated members;
- Sandwich panels;
- Wood trusses, except those built as standard roof trusses for light-frame construction;
- Wood I-joists, except those built as standard floor or ceiling joists for light-frame construction;
- High-load diaphragms.

FABRICATION AND ERECTION DOCUMENTS

Preparation of fabrication and erection documents A registered design professional with experience in the design of prefabricated wood elements and assemblies shall prepare, sign and seal fabrication and erection documents for prefabricated wood elements. The fabrication and erection documents shall include, but are not limited to: design drawings and calculations, connection details, supports, rigging requirements and lifting procedures, and erection bracing and details. Permanent bracing systems for lateral stability shall be detailed and included in the fabrication and erection documents.

Details for bolted connections shall clearly indicate the amount of tensioning required and the ASTM specifications for the nuts, bolts and washers.

Review and approval. Prior to fabrication and erection of wood prefabricated elements,

the wood prefabricated elements fabrication and erection documents shall be submitted to the architect of record and the structural engineer of record for approval, for compliance with the architectural and structural design of the building and the District-approved

construction documents. For prefabricated wood trusses, the architect of record and the structural engineer of record shall also submit a certification of compliance to the Permitting Operations Division. The general contractor shall submit the architect of record/structural engineer of record approved fabrication and erection documents for county approval, in accordance with the following:

- Structural glue-laminated members. Two sets of the fabrication and erection documents shall be submitted to the Special Inspections Section for approval.
- Sandwich panels. Two sets of the fabrication and erection documents shall be submitted to the Special Inspections Section for approval.
- Wood trusses. Three sets of architect of record-approved and structural engineer of record-approved fabrication and erection documents shall be submitted to the Permitting Operations Division for approval. At least one set shall bear the original seal and signature of the registered design professional responsible for truss design. The architect of record and the structural engineer of record shall also submit a certification of compliance to the Permitting Operations Division. After District approval, the Permitting Operations Division shall retain one set of District-approved fabrication and erection documents and shall return the others.

Wood I-joists. Architect of record/structural engineer of record-approved fabrication and erection documents shall be available for use on the construction site. District approval is not required. After District approval, one set of District-approved fabrication and erection documents shall be returned for use on the construction site. The special inspections engineer of record shall use District-approved documents to conduct special inspections and tests during construction.

SPECIAL INSPECTIONS AND TESTS

Erection of elements. The special inspections engineer of record shall conduct special inspections of wood building elements, including connections, during erection as required by the District of Columbia Construction Code for conformance with District-approved documents. The special inspections engineer of record shall verify the following:

Connections. For all buildings, special inspections shall include nailing, bolting, structural gluing or other fastening of the wood elements subject to special inspections. Glue-laminated members and sandwich panels shall bear the mark of an approved agency. When bolted connections are required to be pretensioned beyond snug tight conditions, the special inspections engineer of record shall conduct special inspection of the connections.

High-load diaphragms. Special inspections of site-built assemblies, as required by IBC-1704.6.1 Fabrication of high-load diaphragms, shall include verification of grade, material thickness and member sizes, fastener size and spacing, and assembly installation.

Seismic-resisting systems. Continuous special inspections of field-gluing operations,
and periodic special inspections of mechanical nailing, bolting or fastening operations are required, except fastening of sheathing where fastener spacing is greater than 4” on center.

COMPLETION OF WOOD CONSTRUCTION

Upon completion of wood construction, including connections, the special inspections engineer of record may, after review by the structural engineer of record, submit a completion letter to the Special Inspections Section.

CHAPTER 11
MASONRY

GENERAL

All masonry construction shall comply with IBC-2104. No structural loads shall be imposed on any vertical load carrying member which is less than seven days old or less than 75 percent strength (masonry f'm), unless the masonry strength criteria established by the structural engineer of record for carrying such loads are satisfied. The requirements of this chapter, and IBC-1704.5 Masonry construction and IBC-Table 1704.5.1 Level 1 special inspection and IBC-Table 1704.5.3 Level 2 special inspection, shall apply when masonry building components require special inspections.

Masonry elements. The extent of special inspections depends upon the masonry design method (as "engineered" or "empirical") and the building's occupancy classification (as "essential" or "other").

- "Engineered" masonry design usually means reinforced structural load-bearing masonry, supporting vertical or lateral loads in addition to its self weight. .
- "Empirical" masonry design usually means nonstructural or un-reinforced masonry,
- supporting self weight only. (See IBC-2109 Empirical design of masonry.)
- "Essential" facilities are buildings with Occupancy Category IV that contain occupancies or provide emergency response services that must remain operational after a fire, earthquake or other disaster. (See IBC-Table 1604.5 Occupancy category of buildings and other structures).
- "Other" facilities are buildings with Occupancy Category I, II or III.

The following masonry construction shall be subject to special inspections:

Masonry components. Masonry components as listed below:

- Engineered masonry in Occupancy Category IV
- Empirical masonry, glass unit masonry and masonry veneer in Occupancy Category IV

Exceptions: Empirical masonry, glass unit masonry and masonry veneer in Occupancy Category I, II or III (other) facilities, and certain masonry foundation walls, fireplaces and chimneys.

Protection during masonry wall construction. The general contractor shall ensure that masonry wall construction complies with this section, and with applicable Occupational Safety and Health Administration regulations. The special inspections engineer of record shall verify that construction bracing, with limited access zones, is installed as required and shall immediately notify the Special Inspections Section if either the construction bracing is not installed or limited access zones are compromised. Protection measures include:

Bracing of walls. All masonry walls over 8'-0" in height shall be laterally braced to prevent overturning and collapse unless the wall has adequate permanent lateral support. Construction bracing shall be erected as soon as masonry construction exceeds 8'-0" in height. The bracing shall not be removed for any reason, and shall remain in place until permanent supporting elements of the structure are in place.

Limited access zone. A limited access zone shall be established for construction of any masonry wall greater than 4'-0" in height. Entry to the zone shall be limited to employees actively engaged in constructing the wall. No other persons shall be permitted to enter the zone.
Zone location and extent. The zone shall be established prior to the start of construction of the wall, on the side of the wall which will be unscaffolded. The zone minimum width shall be at least 4'-0" greater than the maximum height of the wall to be constructed, and the zone minimum length shall be greater than or equal to the entire length of the wall to be constructed.
Zone duration. The zone shall remain in place until the wall is laterally supported to prevent overturning and collapse, either by construction bracing or adequate permanent supporting elements of the structure.

FABRICATION AND ERECTION DOCUMENTS

Review and approval. Prior to construction, the general contractor shall submit the masonry fabrication and erection documents, including mortar and grout mix designs, to the architect of record and the structural engineer of record for approval. The general contractor shall submit two sets of the architect of record/structural engineer of record-approved –masonry fabrication and erection documents, including mortar and grout mix designs, to the Special Inspections Program for approval.
Construction bracing design. Construction bracing designs for masonry walls or columns construction shall include consideration of wind forces, workmen and materials loadings, and anchorage, and shall comply with Occupational Safety and Health Administration requirements. Construction bracing designs for walls or columns greater than 12'-0" in height shall be prepared, signed and sealed by a registered design professional. Prior to masonry construction, the general contractor shall submit two sets of construction bracing designs to the Special Inspections Program for approval. After District approval, one set of District-approved fabrication and erection documents shall be returned for use on the construction site. The special inspections engineer of record shall use District-approved documents to conduct special inspections and tests during construction.

SPECIAL INSPECTIONS AND TESTS

The special inspections engineer of record shall conduct special inspections of masonry construction for conformance with District-approved documents and in accordance with IBC-1704.5 Masonry construction, IBC-Table 1704.5.1 Level 1 special inspection, and IBC-Table 1704.5.3 Level 2 special inspection, as appropriate for the type of masonry design and classification of the building occupancy.

- Periodic special inspections for proportions of site-prepared mortar and grout, placement of masonry units, reinforcement, connectors and anchors, cleaning of grout spaces, and construction of mortar joints, as well as cold weather or hot weather protection.
- Continuous special inspections for welding of reinforcing bars, grouting, prestressing, and preparation of mortar specimens, grout specimens, and prisms.
- Certificates of compliance. Verification of f'm prior to construction.

Cold weather. When either the ambient temperature falls below 40°F (degrees Fahrenheit) on any day, or the temperature of masonry units is below 40°F, cold weather

construction requirements as specified in IBC-2104.3 Cold weather construction shall be implemented, which generally includes heating of water and aggregates, and using blankets and heated enclosures as required

Hot weather. When either the ambient temperature equals or exceeds 100F on any day, or the ambient temperature equals or exceeds 90°F with a wind velocity greater than eight miles per hour on any day, hot weather construction requirements as specified in IBC-2104.4 Hot weather construction shall be implemented, which generally includes cooling of water, and using shades and fog spray as required.

Temperature records. The special inspections engineer of record shall record ambient air temperature at regular time intervals during cold weather and hot weather periods.

Temperature readings shall be taken by personnel of the special inspections engineer of record, using tamper-resistant devices. Periodic readings of temperatures are required to verify adequacy of protection methods.

Deficiencies. The general contractor shall adjust cold-weather concreting procedures and protective measures if temperature readings indicate deficiencies in protective measures.

COMPLETION OF MASONRY CONSTRUCTION

Upon completion of masonry special inspections, the special inspections engineer of record may, after review by the structural engineer of record, submit a completion letter to the Special Inspections Program.

CHAPTER 12
STRUCTURAL STEEL

GENERAL

The requirements of this chapter, and IBC-1704.3 Steel construction and IBC Table 1704.3 Required verification and inspection of steel construction, shall apply when construction includes structural hot-rolled steel building elements or structural cold-formed steel building elements for sprayed fire-resistant materials and for mastic and intumescent fire-resistant coatings.

Inspection of steel fabricators and fabrication procedures. The special inspections engineer of record shall conduct special inspection of the steel fabricator and fabrication procedures, as required by IBC-1704.2 Inspection of fabricators, for all steel fabricated assemblies that are themselves subject to special inspections, except as exempted in IBC-1704.3 Steel construction. The report of special inspection of the fabricator and fabrication procedures shall be submitted to the Special Inspections Section.

Certification. The fabricator may demonstrate to the special inspections engineer of record that the requirements of IBC-1704.2 Inspection of fabricators have been met by furnishing AISC STD Certification, or furnishing evidence of compliance with the AISC certification program in the appropriate category.

Procedures implementation. The special inspections engineer of record shall state in writing that the fabricator complies with the fabrication and quality control procedures outlined above. Verification may be on a job basis or by inspection within the previous twelve months.

Steel elements. Structural steel elements as listed below shall be subject to special inspections

Buildings of any height. The following steel elements of buildings, regardless of height:

- Rigid or semi-rigid “moment” connections, field welded or bolted.
- Bolted connections required to be pretensioned beyond snug tight conditions.
- Beam or column elements with clear spans greater than 50’-0” in length or height.
- Trusses, open-webbed joist girders or joists (other than those manufactured to SJI specifications).
- Plate girders of any span.
- Space frames with clear spans greater than 35’-0”.
- Floor decks and roof decks, when designed to act as diaphragms to distribute lateral forces to wind resisting frames.
- Cable supported structures, except tents.
- Bolted or welded lateral bracing elements.
- Buildings more than three stories in height. In addition to the steel elements above, the following steel elements of buildings greater than three stories in height:
- Open-webbed joist girders and steel joists (including those manufactured to SJI specifications).
- Stairs and ladders connecting more than three stories.
- Floor decks and roof decks.
- Field-welded shear studs.
- Welding as required by IBC-1707.2 Structural steel and IBC-1708.4 Structural steel;
- Cold-formed steel framing as required by IBC-1707.4 Cold-formed steel framing.

FABRICATION AND ERECTION DOCUMENTS

Preparation of fabrication and erection documents. The structural steel fabrication and erection documents shall include designs and details for welded and bolted connections.

- Details for connections shall clearly indicate moment connections.
- Details for welded connections shall clearly indicate the type of design and the size and type of welds.
- Details for bolted connections shall clearly indicate the type of design (simple bearing or slip-critical moment), amount of tensioning required (snug tight or fully tensioned) and the ASTM specifications for the bolts, nuts and washers.
- Erection shoring. Shoring for composite construction (concrete slab/steel beam or concrete slab/steel joist), or shoring for erection of structural steel shall be designed to meet the structural engineer of record's requirements.

Review and approval. Prior to fabrication and erection of steel elements, the structural steel fabrication and erection documents shall be submitted to the structural engineer of record, for approval for compliance with the District-approved construction documents and in accordance with the following requirements:

Primary structural system. The structural engineer of record's approval for primary structural elements shall specifically include approval of any connections developed by the steel fabricator. The structural engineer of record shall indicate approval with a signed and sealed statement, attached to the documents, accepting responsibility for the design of connections.

Secondary structural elements. The structural engineer of shall approve the effects the secondary structural elements impose on the primary structural system. The general contractor shall submit two sets of the structural engineer of record-approved structural steel fabrication and erection documents, including the structural engineer of record's approval of connections, to the Special Inspections Section for approval.

After District approval, one set of District-approved fabrication and erection documents shall be returned for use on the construction site. The special inspections engineer of record shall use District-approved documents to conduct special inspections and tests during construction.

SPECIAL INSPECTIONS AND TESTS

Material receiving. The special inspections engineer of record shall conduct special inspections of steel elements, welding material, and high strength bolts upon receipt on the construction site and in accordance with IBC-Table 1704.3 Required verification and inspection of steel construction. High strength bolts and nuts shall be clearly marked with an identifiable manufacturer's mark on both the bolt head and nut. All shipments of high-strength bolts, nuts, and washers, whether from manufacturer, distributor, or reseller, shall include manufacturer's current test reports for chemical composition (ASTM A 751) and mechanical properties, including proof load testing (ASTM F 606).

Steel elements. The special inspections engineer of record shall conduct special inspections of steel elements in accordance with IBC-1704.3 Steel construction and IBC Table 1704.3 Required verification and inspection of steel construction.

Steel erection. Erection shall be in conformance with industry standard practice (AISC 303). Adequate guying and bracing shall be used during the erection process to maintain the stability of the structure. Structural steel, joists, etc. shall not be erected on concrete or masonry footings, piers, walls, etc. less than seven days old, or less than 75 percent strength (concrete f'c or masonry f'm), unless the concrete and masonry strength criteria that have been established by the

structural engineer of record for carrying such loads are satisfied. The special inspections engineer of record shall conduct special inspections of anchor bolts, bolts, welding, connections, and details. Any observed discrepancies between the District approved construction documents and the District-approved structural steel fabrication and erection documents shall be brought to the immediate attention of the structural engineer of record and the Special Inspections Section. All steel elements shall be inspected before they are covered by fire-resistant materials or otherwise concealed.

High strength bolts. Installation shall conform to the District-approved construction documents, District-approved structural steel fabrication and erection documents, and the RCSC specification. In the event any bolt, nut, or washer is broken during normal installation (except bolts purposely over-torqued in order to draw the parts together), the special inspections engineer of record shall bring such failures to the immediate attention of the structural engineer of record and the Special Inspections Section. The special inspections engineer of record shall observe the on-site proof load testing of any suspect bolt(s) per ASTM and AISC standards. Should the bolts fail load testing, they shall be rejected and the structural engineer of record shall make recommendations in writing for remedial actions. All test results and recommendations shall be reported to the Special Inspections Section**.**

Welding. All welders and weld special inspectors shall be certified in accordance with AWS D1.1. Weld inspection shall be in conformance with IBC-1704.3.1 Welding and IBC-Table 1704.3 Item 5 Required verification and inspection of steel construction, inspection of welding. Periodic special inspection rather than continuous special inspection is permitted for the following items:

- Single pass fillet welds not exceeding 5/16 inch in size.
- Floor and roof deck welding.
- Welded studs when used for structural diaphragm.
- Welded sheet steel for cold-formed steel framing members such as studs and joists.
- Welding of stairs and railing systems.

Rigid or semi-rigid connections. When field welding of rigid or semi-rigid connections is required, or when bolted connections are pretensioned beyond snug tight conditions, the special inspections engineer of record shall conduct special inspections of the connections.

Details: The special inspections engineer of record shall conduct special inspection of the steel frame to verify compliance with the details shown on the District-approved construction documents and the District-approved fabrication and erection documents, such as bracing, stiffening, member locations, and proper application of joint details at each connection.

Composite construction: The special inspections engineer of record shall conduct special inspection of shoring required for erection of composite construction

COMPLETION OF STRUCTURAL STEEL CONSTRUCTION

Upon completion of structural steel construction, the special inspections engineer of record may, after review by the structural engineer of record, submit a completion letter to the Special Inspections Section.

CHAPTER 13
TOWER CRANES PERSONNEL HOISTS, MATERIAL HOISTS AND CONSTRUCTION ELEVATORS

GENERAL

The requirements of this section shall apply whenever a tower crane, personnel hoist, material hoist, or construction elevator (herein called "equipment") is to be erected onsite, whether free-standing or attached to the building under construction. Documents shall include the crane or hoist location and crane boom swing. The general contractor and suppliers of tower cranes, personnel hoists, material hoists, and construction elevators are responsible for the safe construction, installation and use of the crane, hoist or elevator. The structural engineer of record is responsible for the structural design strength of the building to support the loads imposed on it by the crane, hoist or elevator. Crane booms shall not swing over public streets without special approval by the District of Columbia /DCRA.

PERMIT REQUIREMENTS

- Tower crane:
- An electrical permit is required.
- A building permit for the crane and its foundation is recommended (but not required).
- Personnel hoist, material hoist or construction elevator:
- An elevator (mechanical) permit is required.
- An electrical permit is required.
- building permit for the hoist/elevator and its foundation is recommended (but not required).

DOCUMENTS

Construction documents and fabrication and erection documents for the crane, hoist or elevator and its foundation shall be prepared by registered design professionals. Prior to the placement of the crane, hoist or elevator foundation, the general contractor or the owner or contractor for the crane, hoist or elevator shall submit one record copy of the following information to the Special Inspections Section:

- Crane specifications. Specifications for cranes shall include manufacturer's operating model number, hook height, boom length, and manufacturer's specifications relative to overturn moment, slewing moment, vertical load (minimum and maximum), shear per bolt group, uplift per bolt group, compression per corner and horizontal shear (minimum and maximum). Fabrication and erection documents shall include the crane location and crane boom swing.
- Personnel hoist and material hoist specifications. Specifications for hoists shall include load lines, load and boom hoist drum brakes, swing brakes and locking devices such as pawls or dogs. The personnel platform shall be designed by a registered design professional.
- Foundations. Fabrication and erection documents shall include structural calculations and design of equipment foundations. Plans and calculations shall clearly indicate footing dimensions, required compressive strength of concrete, steel reinforcement, and allowable soil bearing pressure. The allowable soil bearing pressure shall be consistent with values shown in the soil test report for the project prepared by the geotechnical engineer of record.

Concrete mix design, and steel reinforcement, shall be reviewed and approved by a registered design professional responsible for design of equipment foundations.

- Cranes, hoists or elevators within or attached to the structure. For cranes, hoists or elevators located within or supported by the structure, the fabrication and erection documents shall indicate the size and location of slab openings, method of support or attachment of the crane, hoist or elevator, service loads to be delivered to or imposed on the structure, and the inspections required. Such documents shall be reviewed and approved by the structural engineer of record.

INSPECTIONS

Foundations. The special inspections engineer of record shall conduct foundation inspections, including special inspections for soil bearing capacity, footing construction, and concrete tests. Upon completion of the foundation the special inspections engineer of record shall, after review by the appropriate registered design professionals, submit a completion letter to the Special Inspections Program.

Crane or hoist erection.

- Components. Prior to assembly, the crane or hoist components shall be inspected for structural defects by the crane or hoist manufacturer or a registered design professional.
- Assembly. The crane or hoist shall be assembled according to the manufacturers specifications. All bolts shall be secured in accordance with manufacturer's project specifications, and shall be inspected by the general contractor at erection, 30 days after erection, and every 90 days thereafter.

Electrical and mechanical inspection. An inspection by a District of Columbia Electrical Inspector shall be conducted and approved. Material hoists, personnel hoists and construction elevators shall also be inspected and approved by a District of Columbia Elevator Inspector.

Safety rules and regulations. The Special Inspections Section can require a load test for a crane, hoist or elevator at any time.

Impeding storm, hurricane and tornado: General contractor shall employ adequate measures to ensure safety of jobsite and surrounding areas.

COMPLETION OF TOWER CRANE AND MANLIFT CONSTRUCTION

At the completion of the earth retention system construction, the special inspections engineer of record may, after review by the appropriate registered design professionals, submit a completion letter to the Special Inspections Section.

CHAPTER 14
EARTH RETENTION SYSTEMS

GENERAL

The requirements of this chapter shall apply when construction includes earth retention systems or trenching operations, whether permanent or temporary. Earth retention systems include, but are not limited to:

- Building foundation walls.
- Retaining walls.
- Soldier piles and lagging, with or without tie-backs, post-tensioning or rock anchors.
- Soil nailing systems.
- Drilled piers or other structural means for stabilization of slopes.
- Sheet piling.
- Braced or shored walls.
- Tied-back walls.
- Slurry walls.
- Trench bracing.

Systems. The following earth retention systems are subject to special inspections:

a) All earth retention systems retaining 10'-0" or more of unbalanced fill;
b) All trenching operations deeper than 8'-0";
c) When specified by the structural design, such as, but not limited to:
    - Segmental block retaining walls of any height, with geosynthetic restraints when designed as restrained walls rather than gravity walls.
    - Soldier piles and lagging of any height, with post-tensioned tie-backs.

CONSTRUCTION DOCUMENTS

Earth retention system construction documents, including the related design calculations, shall be prepared, signed and sealed by a registered design professional experienced in the design of such systems. In addition to structural design, the construction documents shall include the following:

- Adjoining properties. Recommendations for protecting adjoining properties, including existing public and private streets.
- Slope protection. Specification of responsibility for protecting all slopes throughout the course of the project in accordance with general practice.
- Dewatering. Any requirements for dewatering of the excavation, as specified or assumed in the earth retention system design.
- Installation. System installation criteria, including allowable inward movement, pile installation and tie-back criteria.
- Special inspections. Special inspections and test criteria for the earth retention system construction. Earth retention system construction documents shall be submitted to the Permitting Operations Division for approval. Construction documents, including field inspection requirements, for earth retention systems which are to become a permanent part of the final structure shall be approved by the structural engineer of record prior to submission to the Permitting Operations Division. After District approval, one set of District-approved construction documents shall be returned for use on the construction site. The special

inspections engineer of record shall use District approved documents to conduct special inspections and tests during construction.

FABRICATION AND ERECTION DOCUMENTS

Preparation of fabrication and erection documents. The registered design professional responsible for the construction documents shall also prepare, sign and seal the fabrication and erection documents.

Review and approval. The earth retention system fabrication and erection documents shall be submitted to the structural engineer of record and the geotechnical engineer of record, as appropriate, for approval. The general contractor shall submit two sets of structural engineer of record/geotechnical engineer of record-approved fabrication and erection documents to the Special Inspections Section for approval prior to construction. After District approval, one set of District-approved fabrication and erection documents shall be returned for use on the construction site. The special inspections engineer of record shall use District approved documents to conduct special inspections and tests during construction.

SPECIAL INSPECTIONS AND TESTS

Special inspections. In problem soils areas, the geotechnical engineer of record shall conduct special inspections of the earth retention system. In non-problem soils areas, either the geotechnical engineer of record or the special inspections engineer of record shall conduct special inspections of the earth retention system. Earth retention systems shall have special inspections conducted for compliance with District approved documents, including, but not limited to, the following:

- Verification of pile-tip depth, tie-backs, post tensioned anchorage, geosynthetic restraints, or other items as specified by the system design.
- Compaction process to determine that materials' quality and in-place density tests comply with the county-approved specifications and geotechnical notes.
- Backfill, foundation drainage systems, and waterproofing during and following their placement for compliance with District-approved backfill, foundation drainage systems, and waterproofing specifications.

Inspection reports. Inspection reports shall be submitted to the appropriate registered design professionals and the Special Inspections Program.

Deviations. Deviations from the District-approved earth retention system construction documents shall be subject to approval by the appropriate registered design professionals, the Permitting Operations Division and the Special Inspections Section prior to work continuing in the affected area.

COMPLETION OF EARTH RETENTION SYSTEM CONSTRUCTION

At the completion of the earth retention system construction, the special inspections engineer of record may, after review by the appropriate registered design professionals, submit a completion letter to the Special Inspections Section.

When the earth retention system is to become a permanent part of the final structure, the structural engineer of record shall approve the completion letter, with such approval indicating that the system is acceptable as a structural element of the final structure, prior to submission to the Special Inspections Section.

CHAPTER 15
EXTERIOR INSULATION AND FINISH SYSTEMS

GENERAL

The requirements of this chapter, and IBC-1704.12 Exterior insulation and finish systems (EIFS), shall apply for all exterior insulation and finish systems (EIFS) applications, except those installed over a water-resistive barrier with a means of draining moisture to the exterior, or those installed over masonry or concrete walls, as exempted in IBC-1704.12.

Construction documents. Construction documents for the EIFS, including the related design calculations, shall be prepared, signed and sealed by a registered design professional. The construction documents shall include, but not be limited to, the following information and details:

- Copy of the EIFS research report.
- Design wind pressure on the EIFS and related calculations.
- Waterproofing and drainage provisions including weep holes and any limitations on EIFS or building materials, especially substrate and building framing, for prevention of moisture infiltration to building sheathing or framing.
- EIFS material types and thicknesses, including flame spread and smoke development ratings.
- Details consistent with intent of the research report and manufacturer's instructions for method of installation at all openings, corners and panel terminations.
- Location and configuration of control joints, weep holes, and flashing.
- Typical cross-sectional configuration showing all components of the wall. All building sheathing and framing materials in contact with the EIFS shall be dampproofed in accordance with IBC-1807.2 Dampproofing required. Wood shall also be naturally durable or preservative-treated in accordance with IBC-2304.11 Protection against decay and termites and IBC-2303.1.8 Preservative-treated wood.
- Typical wall configuration showing details of system penetrations.
- System installation criteria, including ambient temperature limitations.

Three sets of the EIFS construction documents shall be submitted to the Building Plan Review Division for approval. After District approval, the Building Plan Review Division shall retain one set of District-approved construction documents and return the others. One set of District approved documents shall be returned for use on the construction site. The special inspections engineer of record shall use District-approved documents to conduct special inspections and tests during construction.

FABRICATION AND ERECTION DOCUMENTS

Preparation of fabrication and erection documents. The registered design professional responsible for preparation of the EIFS construction documents shall also prepare, sign and seal the EIFS fabrication and erection documents. Information shall include, but not be limited to:

- Reference to research report number and identification of EIFS manufacturer.
- EIFS manufacturer installation and application instructions.
- Layout and details for application of insulation boards.

- Details for control joints, flashing, weep holes, sealants and caulking.
- System installation criteria, including ambient temperature limitations.
- Criteria and timing for special inspections during construction.

Review and approval. The architect of record and the structural engineer of record shall approve the fabrication and erection documents for compliance with the architectural and structural design of the building and the District approved construction documents. The general contractor shall submit two sets of architect of record/structural engineer of record-approved EIFS fabrication and erection documents to the Special Inspections Section for approval prior to EIFS elements' fabrication, erection or application, as appropriate. After approval, one set of District-approved fabrication and erection documents shall be returned for use on the construction site. The special inspections engineer of record shall use District approved documents to conduct special inspections and tests during construction.

SPECIAL INSPECTIONS AND TESTS

EIFS installation shall be executed by trained applicators. All EIFS elements shall be subject to special inspections during erection and application. The special inspections engineer of record shall conduct special inspections of EIFS installations during erection for conformance with District-approved documents.

COMPLETION OF EIFS CONSTRUCTION

Upon completion of EIFS construction, the special inspections engineer of record may, after review by the architect of record and the structural engineer of record, submit a completion letter to the Special Inspections Section.

CHAPTER 16
SPRAYED FIRE-RESISTANT MATERIALS

GENERAL

The requirements of this chapter, and IBC-1704.10 Sprayed fire-resistant materials, shall apply for all applications of sprayed fire-resistant materials used to provide required fire-resistance ratings for structural elements and decks. Sprayed fire-resistant materials shall not be applied to building elements until all other required inspections of the building elements and connections have been conducted and approved. Sprayed fire-resistant materials shall be inspected and approved prior to attachment of other elements of the building and prior to concealment. The special inspections engineer of record shall conduct special inspections and tests of sprayed fire-resistant materials, including:

- Preparation of structural member surfaces.
- Verification of substrate ambient temperatures.
- Ventilation requirements.
- Testing samples for:
- Thickness.
- Density.
- Bond strength.

Construction documents. Designs for sprayed fire-resistant materials shall be approved by DCRA Permit Operations Division (POD). The approved documents shall include the listed in information e.g. Underwriters Laboratories (UL), Inc. Fire Resistance Directory to provide the required fire-resistance rating for structural elements and decks. Structural elements shall be classified as "thermally unrestrained" in accordance with the UL Fire Resistance Directory unless written certification by the structural or fire protection engineer of record is provided to the POD in the building application construction documents that the assembly meets "thermally restrained" criteria.

The fire-resistance designs shall be designated on the District-approved construction documents. Copies of the UL listings shall be provided on the construction site. After District approval, one set of District-approved construction documents shall be returned for use on the construction site. The special inspections engineer of record shall use District-approved documents to conduct special inspections and tests during construction.

FABRICATION AND ERECTION DOCUMENTS

Preparation of fabrication and erection documents. The sprayed fire-resistant material manufacturer's installation requirements and details, including specific UL listing information, shall be included on the fabrication and erection documents. Unusual or special design features such as adhesives, overcoats, metal lath, netting, etc., and clips, standoffs or other devices necessary for attachment of other elements of the building shall be specifically detailed.

Review and approval. The fabrication and erection documents shall be approved by both the architect of record and the structural engineer or fire protection engineer of record. The general contractor shall submit a copy of the approved building permit construction documents with approved fabrication and erection documents to the Special Inspections Section for approval. One set of District-approved documents shall be returned for use on the construction

site. The special inspections engineer of record shall use District-approved documents to conduct special inspections and tests during construction.

SPECIAL INSPECTIONS AND TESTS

Special Inspections. The special inspections engineer of record shall conduct special inspections and tests of sprayed fire-resistant materials to verify compliance with IBC-1704.10 Sprayed fire-resistant materials and the following:

Building elements and connections. In addition to other required inspections of the building elements and connections, inspections shall include any unusual or unique design features or devices as shown on the District-approved fabrication and erection documents for sprayed fire-resistant materials. Sprayed fire-resistant materials shall not be applied to building elements until all other required inspections of the building elements and connections that will be concealed have been conducted and approved. The sprayed fire-resistant materials shall be applied to all surfaces and lengths of members such that the continuity of fire-resistance required by the District-approved fire-resistive designs is obtained.

Sampling and testing.

- Thickness and density. Sampling and testing shall be in accordance with IBC-1704.10.3 Thickness, IBC-1704.10.4 Density and ASTM E 605, at least once for each 1,000 square feet of sprayed area for floors, roofs and walls and 25 percent of the structural members on each floor.
- Bond strength. Sampling and testing shall be in accordance with IBC-1704.10.5 Bond strength and ASTM E 736, at least once for each 10,000 square feet of sprayed area for floors, roofs and walls and one of each type of structural member per 10,000 square feet on each floor.

Attachment of other elements. Other building elements such as precast concrete spandrel panels, electrical conduits, mechanical ductwork or metal studs whose installation would interfere with the application of sprayed fire-resistant materials shall not be installed until after approval of the sprayed fire-resistant materials. Sprayed fire-resistant materials shall be inspected and approved before attachment of other elements of the building, and shall not be scraped off or removed to attach other building elements. Prior to concealment, sprayed fire-resistant materials shall be inspected and approved after attachment of other elements of the building. Any damaged sprayed fire-resistant materials shall be repaired.

COMPLETION OF SPRAYED FIRE-RESISTANT MATERIALS

Upon completion of sprayed fire-resistant material construction, the special inspections engineer of record may, after review by the architect of record and the structural engineer of record, submit a completion letter to the Special Inspections Section.

CHAPTER 17
MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS

GENERAL

The requirements of this chapter, DCMR 12 A, chapter 1A and IBC-1704.11 Mastic and intumescent coatings, shall apply for all applications of mastic and intumescent fire-resistant coatings used to provide required fire-resistance ratings for structural elements and decks. Mastic and intumescent fire-resistant coatings shall not be applied to building elements until all other required inspections of the building elements and connections have been conducted and approved. Mastic and intumescent fire-resistant coatings shall be inspected and approved prior to attachment of other elements of the building and prior to concealment. The special inspections engineer of record shall conduct special inspections and tests of mastic and intumescent fire-resistant coatings, including preparation of structural member surfaces, verification of substrate ambient temperatures and ventilation requirements, and testing samples for thickness.

Construction documents. Designs for mastic and intumescent fire-resistant coatings shall be listed in the Underwriters Laboratories, Inc. (UL) Fire Resistance Directory to provide the required fire-resistance rating for structural elements and decks. Structural elements shall be classified as "thermally unrestrained" in accordance with the UL Fire Resistance Directory unless written certification by the structural engineer of record is provided to the Special Inspections Section that the assembly meets "thermally restrained" criteria. The fire-resistance designs shall be designated on the county-approved construction documents. The manufacturer's installation requirements and details, including coating thickness and unusual or special design features such as adhesives, overcoats, metal lath, netting, etc., and clips, standoffs or other devices necessary for attachment of other elements of the building shall be specifically detailed.

After District approval, one set of District-approved construction documents shall be returned for use on the construction site. Copies of the UL listings shall be provided on the construction site. The special inspections engineer of record shall use county-approved documents to conduct special inspections and tests during construction.

SPECIAL INSPECTIONS AND TESTS

Coatings. The special inspections engineer of record shall conduct special inspections and tests of mastic and intumescent fire-resistant coatings to verify compliance with IBC-1704.11 Mastic and intumescent fire-resistant coatings and the following:

Building elements and connections. In addition to other required inspections of the building elements and connections, inspections shall include any unusual or unique design features or devices as shown on the District-approved construction documents for mastic and intumescent fire-resistant coatings. Mastic and intumescent fire-resistant coatings shall not be applied to building elements until all other required inspections of the building elements and connections that will be concealed have been conducted and approved. The mastic and intumescent fire-resistant coatings shall be applied to all surfaces and lengths of members such that the continuity of fire-resistance required by the District-approved fire resistive designs is obtained.

Sampling and testing. Sampling and testing of mastic and intumescent fire-resistant coatings shall be in accordance with AWCI 12-B.

Attachment of other elements. Other building elements such as precast concrete spandrel panels, electrical conduits, mechanical ductwork or metal studs whose installation would interfere with the application of mastic and intumescent fire-resistant coatings shall not be installed until after approval of the mastic and intumescent fire-resistant coatings. Mastic and intumescent fire-resistant coatings shall be inspected and approved before attachment of other elements of the building, and shall not be scraped off or removed to attach other building elements. Prior to concealment, mastic and intumescent fire-resistant coatings shall be inspected and approved after attachment of other elements of the building. Any damaged mastic and intumescent fire-resistant coatings shall be repaired.

COMPLETION OF MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS

Upon completion of mastic and intumescent fire-resistant coatings, the special inspections engineer of record may, after review by the architect of record and the structural engineer of record, submit a completion letter to the Special Inspections Section.

CHAPTER 18
SMOKE CONTROL SYSTEMS

GENERAL

The requirements of this chapter, DCMR 12 A, chapter 1A and IBC-1704.14 Special inspection for smoke control, shall apply for all smoke control systems.

FABRICATION AND ERECTION DOCUMENTS

Preparation of fabrication and erection documents a registered design professional with experience in the design of smoke control systems shall prepare, sign and seal fabrication and erection documents for the smoke control system. In accordance with DCBC-909 Smoke control systems, the fabrication and erection documents shall be in accordance with the approved building permit documents. The approved documents shall include, but are not limited to, the following information

- Design method, calculations and analysis to include general design requirements and supporting documents with the rational analysis of the type of smoke control, method of operation, supporting systems and method of construction.
- System components, elements and details.
- Scope, extent, procedures and methods for special inspections and tests.
- All plans shall bear the original seal and signature of the responsible registered design professional. After District approval, one set of District-approved construction documents shall be returned for use on the construction site. The special inspections engineer of record for smoke control systems shall use District-approved documents to conduct special inspections and tests during construction.

SPECIAL INSPECTIONS AND TESTS

Special inspector. As required by IBC-1704.14.2 Qualifications, special inspections and tests for smoke control systems shall be conducted by qualified individuals, agencies or firms with expertise in fire protection engineering, mechanical engineering and certification as air balancers. The special inspections engineer of record for smoke control systems shall be approved by the Permitting Operations Division and Special Inspections Program,. The special inspections engineer of record for smoke control systems might be different from the special inspections engineer of record for other special inspections.

Special inspections. The special inspections engineer of record for smoke control systems shall conduct special inspections and tests shall as required by this section, and IBC-1704.14.1 Testing scope. Special inspections and tests shall be conducted during erection of ductwork and prior to concealment, and after completion and prior to occupancy.

Special inspections. Special inspections of smoke control systems shall assess, document and verify the following systems and elements:

- Automatic dampers.
- Control air tubing and direct digital control wiring.
- Control diagrams and sequences.
- Fan belts.
- Exhaust fan components.
- Power: normal and standby.

Tests. Tests of smoke control systems shall document and verify the adequate performance of:

- Control elements and sequences.
- Control air tubing and direct digital control wiring.
- Control devices.
- Dampers.
- Detection devices and their tolerances.
- Doors.
- Ducts and shafts.
- Fans.
- Inlets and outlets, including sizes and positions.
- Pressurized stair enclosures.
- Smoke zone or area boundary elements and barriers.
- Response times.
- Leakage of boundary or barrier elements, including doors and partitions.
- Power: normal and standby.

All special inspections and testing results, including rejections and subsequent follow-up retests and corrective actions, shall be recorded and form part of the final report. Final reports shall verify compliance with all portions of IBC-909.18 Acceptance testing, DCBC-909.19 System acceptance and DCBC-909.20 Smoke proof enclosures, as applicable.

COMPLETION OF SMOKE CONTROL SYSTEMS

Upon completion of smoke control systems, the special inspections engineer of record for smoke control systems shall prepare a complete final report of testing (for review by a registered design professional responsible for smoke control system design. After approval, a registered design professional shall sign and seal the final report, for submittal to the Permitting Operations Division and the Special Inspections Section.

CHAPTER 19
FINAL REPORT OF SPECIAL INSPECTIONS & OCCUPANCY PROCESS

RESPONSIBILITY

It is the responsibility of the Owner or the Owner's agent to submit the Final Report of Special Inspections, obtain the necessary building and trades inspections, file and obtain a Certificate of Use and Occupancy from DCRA, prior to occupancy or use of any constructed buildings/structures or tenant spaces.

PROCEDURAL REQUIREMENTS

Inspections:

The following are required prior to issuance of Certificate of Use and Occupancy:

Final Report of Special Inspections One (1) original set of the Final Report of Special Inspections bearing the original signatures and seals of the SIER and RDPRC, shall be submitted to the Special Inspections Section after completion of inspections of all items specified in the District approved special inspections schedule. The Final Report of Special Inspections must be supported by:

- The completed Special Inspections Schedule, indicating the start date and completion date of inspection(s).
- Deficiency List with all deficiencies resolved, corrected or accepted by the appropriate registered design professional. A project in which no deficiencies shall have a blank Deficiency List submitted
- Any inspections and testing reports that have previously not been submitted to DCRA.

The Special Inspections Section staff, responsible for the project, will perform review of the report and perform walk-through quality assurance inspections of the project before accepting the report. The Contractor will be allowed to schedule for building inspections, namely, wall and/or ceiling concealment and final inspections only after the Final Report of Special Inspection is approved.

Partial certification On occasions where portion(s) of the building requires building concealment prior to completion of all special inspection items, partial certification is allowed. The requirements of the partial certification are the same as the requirements for the Final Report of Special Inspections explained above. However, the certification must be identified as partial on the Final Report of Special Inspections form. A letter, supported by a layout of the building, describing the portion of the building that requires partial concealment must be submitted. A Deficiency List shall also be submitted although deficiencies in areas other than the portion of the building to be concealed may not necessarily be resolved at the time of submitting the partial certification. It is possible to have more than one (1) partial certification. However a Final Report of Special Inspections must be submitted upon completion of all special inspections items for projects for which partial certifications have been submitted.

Projects that may require submission of partial report include, but not limited to, the following:

- Special Inspections with EIFS construction as an item,

- Buildings with Sprayed fire-resistant material or Mastic and intumescent fire-resistant coatings application
- Phased construction projects

Final Report of Special Inspections for Projects Involving Smoke Control Systems
In addition to the Final Report of Special Inspections submitted to Special Inspection Program for other specified building items, a separate Final Report of Special Inspections, bearing the seals and signatures of the SIER and MER for the smoke control system shall be submitted for projects involving smoke control system to the Special Inspection Program for review and approval.
Final approval from all four trade sections (Building, Mechanical, Electrical, Plumbing and Gas).

Any tenant space that is to be used for the purpose of food service is required to be approved by the District Health Department

Partial Occupancy and Tenant Improvements
The following procedures shall be implemented for protecting buildings during partial occupancy and tenant improvements. In all types of construction, with or without a fire suppression system, the following will be done:

- All combustible storage on any floor shall be located and conform to the following conditions:
- The sprinkler system, if applicable, shall be designed for the hazard involved, usually Ordinary Hazard Group II as a minimum.
- Sprinkler heads shall be located within 12 inches of the floor/ceiling above, using upright type of sprinkler heads.
- If the building design calls for a suspended ceiling, the entire ceiling system shall be in place in the area where combustible storage is located. Pendant type sprinklers are required.
- If the combustible storage is limited to a partial floor area, the storage area shall be separated from the remainder of this floor by a full height floor/ceiling non-combustible partition or the entire floor shall be sprinkled.

CHAPTER 20
SAFEGUARDS DURING CONSTRUCTION

The requirements of this chapter and IBC Chapter 33 Safeguards during construction shall apply to all construction sites.

PROTECTION OF THE PUBLIC

Materials and equipment. The general contractor is responsible for safe storage and placement of materials and equipment, as required by IBC-3301.2 Storage and placement.

Occupied buildings. Means of egress from occupied buildings shall be maintained at all times, shall not be blocked, and shall not pass through construction areas. In the event that existing exits are proposed to be blocked by construction, alternative exits shall be provided or constructed in advance and approved. Occupied buildings undergoing remodeling or additions shall also comply with the requirements of IBC-3302 Construction safeguards. Fire protection devices and equipment shall be maintained at all times throughout the building.

Fencing, construction railings, barriers and covered walkways. The general contractor shall install construction site fencing, construction railings, barriers and covered walkways for protection of the public, in accordance with this section and IBC-3306 Protection of pedestrians, prior to the excavation for footings or underground utilities, and continuing for the duration of the construction project. Impact barricades required for projects located in close proximity to a public use roadway shall be installed in accordance with the District of Columbia Department of Transportation regulations.

Site fencing. Every construction site shall be enclosed with a nonclimbable fence not less than 6’-0” high. The general contractor shall have the option of fencing the total perimeter of a construction site or an area within a minimum of 20’-0” away from the structure. Fencing shall be maintained until the building can be secured against entry and the exterior site is free of hazards.

Construction railings, barriers and covered walkways. Covered walkways, construction railings and barriers shall be of noncombustible or fire-retardant treated materials and shall comply with IBC-3306.1 Protection of pedestrians and IBC-Table 3306.1 Protection of pedestrians, except that construction railings or barriers located outside the building may be of any approved material. Construction railings shall be 3’-6” high. Covered walkways shall be as wide as required for corridors or exits, or at least 4’-0” wide, whichever is greater, and shall include necessary illumination. See IBC-3306.7 Covered walkways for construction criteria. Barriers, when required by IBC-Table 3306.1 Protection of pedestrians, shall comply with IBC-3306.5 Barriers and IBC-3306.6 Barrier design.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

The general contractor shall ensure that the construction site is safe and in compliance with all applicable Occupational Safety and Health Administration regulations. A copy of the Occupational Safety and Health Standards for the Construction Industry shall be available on the construction site at all times.

FIRE PROTECTION

Fire extinguishers. The general contractor shall be responsible for installing and maintaining portable fire extinguishers during construction, at each floor level, in storage sheds, and wherever flammable or combustible materials are used or stored, as required by IBC-3309 Fire extinguishers.

Standpipes. In buildings four stories or more in height, the general contractor shall be responsible for installing and maintaining standpipes during construction as required by IBC-3311 Standpipes. Standpipes shall be installed during construction as the work of the building progresses, beginning at 40'-0" in height. Standpipes shall be extended as construction progresses to within one floor of the highest point of construction having secured decking or flooring and shall be installed and ready for use as each floor progresses. Free access from the street to such standpipes shall be maintained at all times. Materials shall not be stored within 5'-0" of any fire hydrant or in the roadway between such hydrant and the center line of the street. Failure to comply with this section shall result in the immediate stop of all work on the project until such time as the standpipes are properly placed.

Fire suppression system. Sprinkler systems shall comply with IBC-3312 Automatic sprinkler system. Sprinkler systems shall be tested and approved prior to occupancy of any portion of the building. Sprinkler control valves shall only be operated by authorized personnel.

FIRE PROTECTION AND SAFETY REQUIREMENTS FOR PARTIALLY OCCUPIED BUILDINGS

The existing fire protection, egress paths, and fire-resistant construction protection required for occupied areas shall be maintained at all times while ongoing construction in unoccupied areas is in progress.

Material storage.

- Noncombustible storage, area limitations. Noncombustible materials are those that do not support combustion and are not readily ignitable. Examples of noncombustible materials are: drywall; metal studs, fire retardant lumber; metal doors; solid core wood doors, including packaging aids without voids; sheet metal ducts; masonry; noncombustible insulation; plumbing fixtures; light fixtures wrapped in tight plastic; and other materials of similar characteristics. Noncombustible storage may be unlimited in area; however, the weight of material stored shall not exceed the structural design capacity of the floor.
- Combustible storage, area limitations. Combustible materials are those that readily support combustion or are readily ignitable. Examples of combustible materials are: hollow core wood doors; wood studs, paneling and other wood products; carpet and padding; vinyl core trim and base; insulation with combustible vapor facing; noncombustible products wrapped in large quantities of combustible packaging or storage aids, and other materials of similar characteristics. Combustible storage shall be limited to 2,500 cubic feet or 10 percent of the floor area, whichever is smaller; however, the weight of material stored shall not exceed the structural design capacity of the floor. Combustible storage areas located on an occupied floor shall be separated from the occupied areas by one-hour fire-resistance rated fire partitions.
- Storage arrangement. Stored materials shall be arranged in neat piles with the floor kept broom clean and free of construction debris. Egress aisles shall be maintained. Storage shall be kept a minimum of 2'-0" below ceilings, sprinkler heads, or the lowest member of the floor/ceiling or roof/ceiling assembly.

Fire suppression system requirements.
Sprinkler systems shall comply with this section and IBC 3312 Automatic sprinkler system. In fully sprinkler-protected buildings, sprinkler protection shall be operational at all times throughout the entire building, including areas under construction

a) Sprinkler heads that are or will be installed within 1'-0" of the floor/roof above shall be installed in either the upright position with upright heads, or the pendant position with pendant heads. If the ceiling or ceiling grid is in place, the sprinkler heads shall be installed in the pendant position, with pendant heads.
b) Sprinkler heads that are or will be installed at a ceiling line located lower than 1'-0" below the floor/roof above shall be installed either in the upright position and turned up to within 1'-0" of the floor/roof above with upright heads, or in the pendant position with pendant heads at the ceiling line. In the pendant position, the entire ceiling must be constructed, or the ceiling grid with all ceiling tiles must be in place. If the entire ceiling is not constructed, or the ceiling grid does not have all ceiling tiles in place, then in lieu of standard response sprinkler heads, the use of commercial, rapid or quick response sprinkler heads, with at least a 2'-0" x 2'-0" ceiling tile suspended at each sprinkler head to act as a heat trap, shall be subject to approval. Such rapid or quick response sprinkler heads may later remain as part of the permanent sprinkler system.

Special cases. The criteria for fire prevention measures set forth in this section cover the majority of field conditions. It is conceivable that individual situations may arise which shall be evaluated for compliance on a case by case basis.

ABBREVIATIONS AND PROMULGATING AGENCIES

A2LA The American Association for Laboratory Accreditation
5301 Buckeystown Pike, Suite 350
Frederick, MD 21704
301-644-3248
www.a2La.org

ACI: ACI International (American Concrete Institute)
P.O. Box 9094
Farmington Hills, MI 48333
248-848-3700
www.aci-int.net

AISC: American Institute of Steel Construction, Inc.
One East Wacker Drive, Suite 3100
Chicago, IL 60601-2001
312-670-2400
www.aisc.org

AWCI: Association of the Wall and Ceiling Industry
513 West Broad Street, Suite 210
Falls Church, VA 22046
703 538-1600
www.awci.org

AMRL (AASHTO Materials Reference Laboratory)
4441 Buckeytown Pike
Suite A
Frederick, MD 21704
240-436-4900
www.amrl.net

ASCE American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 20191-4400
800-548-2723
www.asce.org

ASNT American Society for Non-Destructive Testing
P.O. Box 28515
1711 Arlingate Lane
Columbus, OH 43228-0518
800-222-2768
www.asnt.org

ASTM: American Society for Testing and Materials
100 Barr Harbor Drive West
Conshohocken, PA 19428-2959
610-832-9585
www.astm.org

AWS: American Welding Society
550 N.W. LeJeune Road
Miami, FL 33126
800-443-9353
www.aws.org

BIA: Brick Industry Association
11490 Commerce Park Drive, Suite 300
Reston, VA 20191-1525
703-620-0010
www.bia.org

CASE: Council of American Structural Engineers
American Council of Engineering Companies
1015 Fifteenth Street N.W., 8th Floor
Washington, DC 20035-2605
202-347-7474
www.acec.org

CCRL: (Cement and Concrete Reference Laboratory) Building and Fire Research Laboratory
4441 Buckeytown Pike
Suite C
Frederick, Maryland 21704
301-975-5900
www.bfrl.nist.gov

CRSI Concrete Reinforcing Steel Institute
933 North Plum Grove Road
Schaumburg, IL 60173-4758
847-517-1200
www.crsi.org

ICC: International Code Council, Inc.
500New Jersey Ave NW
Washington, DC 20001
1-888-422-7233
www.iccsafe.org

NCMA: National Concrete Masonry Association
13750 Sunrise Valley Drive
Herndon, VA 20171-4662
703-713-1900
www.ncma.org

NFPA: National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471
617-770-3000
www.nfpa.org

NICET: National Institute for Certification in Engineering Technologies
1420 King Street
Alexandria, VA 22314-2794
888-476-3238
www.nicet.org

NIST: National Institute of Standards and Technology
100 Bureau Drive, Stop 3460
Gaithersburg, MD 20899-3460
301-975-8295
www.nist.gov

NVLAP: National Voluntary Laboratory Accreditation Program
National Institute of Standards and Technology
100 Bureau Drive, Stop 2140
Gaithersburg, MD 20899-2140 301-975-4016
301-975-4016
www.nist.gov/nvlap

OSHA U.S. Dept. of Labor Occupational Safety & Health Administration
200 Constitution Avenue
Washington, DC 20210
800-321-6742
www.osha.gov

PCA: Portland Cement Association
5420 Old Orchard Road
Skokie, IL 60606
312-786-0300
www.cement.org

PCI Precast /Prestressed Concrete Institute
209 West Jackson Boulevard, Suite 500
Chicago, IL 60606
312-786-0300
www.pci.org

PTI Post-Tensioning Institute
8601 North Black Canyon Highway, Suite 103
Phoenix, AZ 85021
602-870-7540
www.post-tension.org

RCSC Research Council on Structural Connections
c/o American Institute of Steel Construction
One East Wacker Drive, Suite 3100
Chicago, IL 60601-2001
312-670-2400
www.boltcouncil.org

SDI: Steel Deck Institute
P.O. Box 25
Fox River Grove, IL 60021
847-458-4647
www.sdi.org

SJI: Steel Joist Institute
3127 10th Avenue, North Ext.
Myrtle Beach, SC 29577-6760 843-626-1995
www.steeljoist.org

TMS: The Masonry Society
3970 Broadway, Suite 201-D
Boulder, CO 80304-1135
303-939-9700
www.masonrysociety.org

TPI: Truss Plate Institute
583 D'Onofrio Drive, Suite 200
Madison, WI 53719
703.683.1010
www.tpinst.org

USG: United States Gypsum
Corporation Headquarters
550 West Adams Street
Chicago, IL 60661-3676
ph: (312) 436-4000
www.usg.com

UL: Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062-2096
1-847-272-8800
www.ul.com

WACEL: An Association Of Engineering Laboratories,
Inspection Agencies And Building Officials
7508 Wisconsin Avenue, 4th Floor
Bethesda, MD 20814
301-652-7925
www.wacel.org